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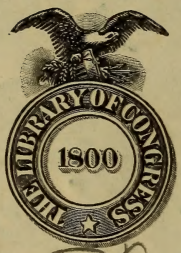

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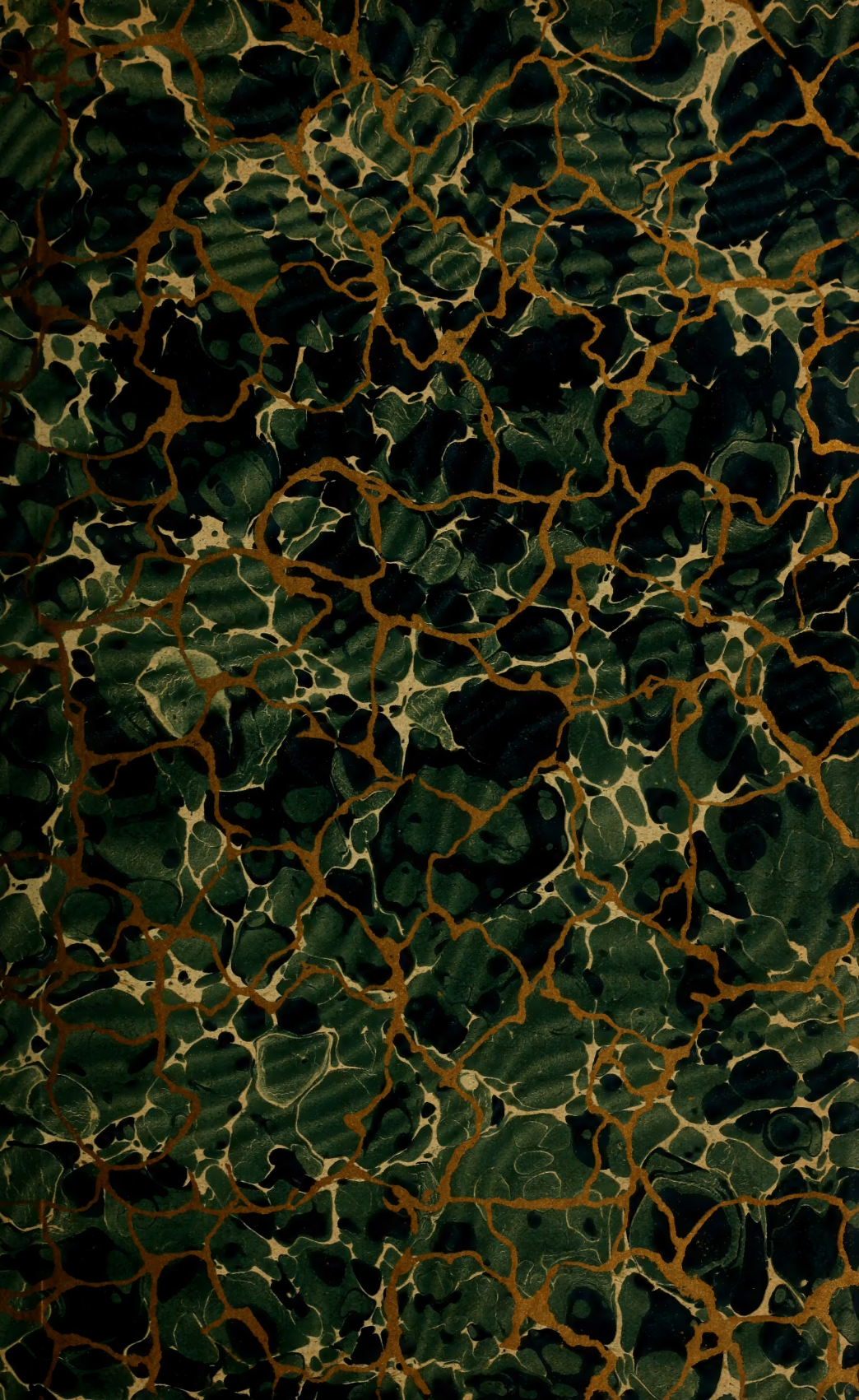

Century Book of Health

THE MAINTENANCE OF HEALTH
PREVENTION AND CURE OF DISEASE · MOTHERHOOD · CARE
FEEDING AND DISEASES OF
CHILDREN · MODERN HOME
NURSING · ACCIDENTS AND EMERGENCIES · INJURIOUS HABITS
A COMPLETE PRACTICAL GUIDE

BASED UPON THE LATEST MEDICAL PRACTICE
RECENT DISCOVERIES IN SCIENCE
AND U. S. PHARMACOPŒIA
REVISION OF 1905

J. H. McCORMICK, M.D., Editor-in-Chief

Member: American Therapeutical Society, Medical Society of the District of Columbia, Medical Association of the District of Columbia, Medical and Surgical Society, Washington, D. C., Anthropological Society, Biological Society
Maryland Public Health Association

THE KING-RICHARDSON COMPANY

SPRINGFIELD, MASS. BUFFALO, N. Y. CHICAGO, ILL.

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INTRODUCTION.

By JOHN H. McCORMICK, M.D.

The study of medicine, not as an accomplishment, but as a subject of the first importance to the individual, should be taken up by every one. The care of our bodies is our first duty to ourselves. "Self-preservation is the first law of Nature." In obedience to that law all should learn from undoubted authorities how to preserve a healthful condition of body, to ward off disease, to care for and to feed the sick, as well as to render aid to the injured in emergencies. The need of this study is all the more emphasized by the statement upon the highest medical authority that nearly all of our ailments are produced and propagated by either our own ignorance or our own carelessness.

At no period of the world's history have the people been so well qualified to take up the study of health as they are now. Physiology and other science subjects, taken up of late years in the schools of the country, have given a solid foundation upon which a sound knowledge of the human body and its needs may rest. This fact and the wonderful advances in medical science require that the subject be approached in a very different way from that which satisfied our immediate ancestors. Ten years have made a wonderful change in our knowledge of health and disease. Treatises that were excellent in their day now fail to meet the new conditions in so many respects that new and revised editions no longer satisfy.

The study of medicine is not limited, as so many think, to the healing of the sick. It is a many-sided science; in fact, it levies tribute upon all sciences, and, like the honeybee, takes what it needs from all of the flowers in the garden of knowledge. One of its most important aspects is the prevention of disease, which every one can practise to his own and his family's great welfare. This means much more than to

merely abide by the laws and regulations of boards of health and city ordinances.

A parent who can train the sons and daughters of the family to right habits of life and the practice of daily personal hygiene, confers upon them the inestimable blessing of a magnificent start in life. When by these means the predisposing causes of disease are removed, or at least modified, the children are passed safely through the numerous evils incident to childhood and youth.

The mother who performs the highest act of life—the conferring of life itself upon her child—needs much more than mere maternal instinct to guide her in the rearing of her child. However much we may be tempted to admire that unerring quality in the lower animals, we know that safe rules and guides are necessary to secure to a child its first right of being well born and, second, of being properly developed.

Mothers cannot know too much. They go forward into an undiscovered country, and may at any moment meet with strange conditions of health and disease with which they are compelled to deal, and the most loving and conscientious mother must pay the same penalty for her ignorance that others pay for willful neglect.

In seasons of epidemic or of ordinary exposure to contagious disease, every one should know the proper preventive measures to be taken to ward off an attack. Sitting in quiet ignorance on such occasions is more than an error; it is a crime. For not only is the individual himself likely to suffer, but he is a means of passing the disease along and of communicating it to others.

Only those whose knowledge of nursing and of cooking for the sick qualifies them to minister to the comfort of their loved ones when they are ill, know the joy of efficient personal attention and the flood of sympathetic care which often works magic in the cure of a disease. What a sense of disappointment and loss of self-confidence is felt when on such occasions we realize our ignorance of the right thing to be done, and

> "These hard, well-meaning hands we thrust
> Among the heartstrings of a friend."

And yet how comparatively easy this knowledge is of acquisition and

what a power for good it makes of its possessor. How we are forced to admire the calm, direct effort of the one who knows just what to do in emergencies and accidents; while the ignorance of helpful measures causes panic and helpless confusion in others. "Knowledge is power" undoubtedly on such occasions, and very often it has been the power of saving life when out of reach of a doctor's aid.

Why do not people generally know as much about these things as they do about some others? Why do they not know more about medicine than they do? Ignorance of the subject not only exposes them to the ravages of disease; and deprives them of the joy of caring for their loved ones when ill; but, worst of all, it exposes them to the cruelty and robbery of the quack and charlatan, because they have not the power of knowing the impostor and incompetent from the trustworthy and skilled.

The medical fraternity are not to be expected to teach people this knowledge. Theirs is a profession and one of hard work. They have not the time to give such instruction to their patrons, and it is not to be expected from them. It must be derived from other sources.

The labor attached to the gathering together of matter from so many sources; of subjecting it to modern criticism; of arranging to the best advantage what would prove most helpful,—has been a task of no slight magnitude. That, however, has been forgotten when it is remembered that we have the honor of presenting a work that is at once reliable in its recommendations, trustworthy in its advice, and clear and plain in its instructions and explanations.

There are many new features incorporated in this work which we feel are of especial value. Not the least of these is the *Materia Medica,* where the drugs and medicines alluded to in the body of the work are explained as to their origin, effects, and doses. It has been insisted upon on the ground that the reader of this book is an intelligent person, and should know exactly what is being done when medicine is given.

The copious topical index, and the emergency index for consultation in accidents and sudden illness, have been prepared with especial regard for quick reference.

We have no apology to make for the explanation of the treatment

of disease by the homeopathic methods, nor by the methods of the older school. Nor have we any to make to either of these schools for the explanation of the principles of osteopathy and other special systems. Our aim has been to give to the reader an intelligent idea of what all are doing, with a view to the treatment of disease and the alleviation of the sufferings of mankind.

The work is mainly educative. For both general reading and study, the subjects of the book have been arranged in the order in which each should be taken up. The study proceeds from the known to the unknown in the order in which it will prove most helpful to those who take it up. There are some chapters which are to be carefully studied in detail for the information which will be of service in emergency and illness. The work is not alone for consultation in times of distress and danger. It is for reading and study by all of the members of the family in health that they may wisely avoid the errors of daily life; and in cases of illness, that each may contribute something, according to his ability, to relieve the suffering.

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BOOK I.

THE MAINTENANCE OF HEALTH

PERSONAL HYGIENE.

We are prodigal and wasteful of good health, and what we learn about the care of our bodies is often the result of bitter experience. There is a true saying that "We do not know the value of health until we have lost it." If it were possible for us to live our lives over, the greatest change and improvement that we would make would probably be in the direction of leading correct and hygienic lives.

The word "hygiene" has a vague and somewhat meaningless force to the minds of many, who at best regard it as having something to do with medicine. We have only to remember that the word is derived from a Greek adjective meaning healthy. So highly was this branch of knowledge esteemed by the Greeks that they made Hygeia, the daughter of Esculapius, the goddess of health; and the highest ideal of Greek citizenship was the possession of "a sound mind in a sound body."

But probably the only successful attempt to connect the laws of health with the people's mode of life was that made by Moses in his wonderful association of hygiene and religion. In his system he minutely set down the laws of personal and tribal life to be carefully followed by his people. These laws impress us as being most intelligently adapted to the mode of living and the social conditions of his day.

But the modern world has approached the question from another side, and instead of making the sanitary conditions depend almost wholly upon the efforts of the individual, there have been incorporated systems of sewerage, drainage, and water supply that secure results with less and less individual effort and responsibility.

Health is that condition of mind and body in which all of the functions of the organs and parts are performed without pain or disease. Disease may be regarded as the result of accident or of willful violation of Nature's laws. Nature knows absolutely no forgiveness. She is the most exacting, relentless, and impartial judge that ever presided over a court and inflicted punishment. Ignorance of the law is no excuse; and there is no delay in the execution of sentence. We are not always conscious of the punishment and may at times congratulate ourselves that we have

escaped the penalty of our hygienic transgressions. But when the day of reckoning comes, as it inevitably does, the folly of this attitude is very manifest.

We must regard the observance of laws of right living as being of prime importance to those who are in good health. It is the means of maintaining good health. Hygiene is not a hobby or a fad. The principles are very simple and should form a large and early part of every child's education. Good health is the greatest heritage with which a person can be endowed. The first responsibility of parents is the enforcement of the laws of health, not only by precept but by example. Right living may easily be made a habit, so that any unhealthy conditions soon become a positive discomfort against which one turns instinctively.

HYGIENE AND GENERAL CARE OF THE DIGESTIVE APPARATUS.

The chief organs included in this group are the mouth, teeth, throat, stomach, and bowels. They need protection against cold and chills, for the diseases which attack them from this cause are very severe and dangerous. This is provided by suitable clothing, which is discussed in another section. The care of the skin has also a very important bearing upon these organs, and that has been taken up under the head of baths and bathing. Both of these points are very essential to the healthy condition of these organs.

But the most important features in the hygiene of the very complex digestive system are food and exercise.

Food.—An exhaustive consideration of the influence of food upon digestion calls for a discussion of the chemical nature of the several articles upon which man lives; the relative values of these articles as nourishment to the body; the digestibility of all the kinds of food; and the art of cooking. Obviously such a critical and exhaustive treatment of the subject is impossible at this time. But there are many generalizations deduced from the array of facts gleaned by scientists which are of prime importance to assist us in the care of these important parts of our bodies.

The evils which arise from disregard of the hygienic principles of food and digestion are largely due to the fact that the process of digestion, compared with other processes such as respiration and circulation, is tremendously complex. All complicated machines and systems are

very easily put out of order with very serious consequences. Derangement of the digestive organs with the attendant train of evils is largely the result of a long period of slight but continued habits of abuse; and, as they are usually a long time in developing, they are a correspondingly long time in being removed, either by the correction of bad habits or by medical prescription.

Selection of Food.—Except in the case of children, who are too young to make a wise selection of food, little attempt is made to prescribe a diet for healthy persons, who usually follow the dictates of the palate or the teachings of experience. Beyond certain broad principles, no hard and fast rules are possible for personal guidance in the choice of food; for it has been wisely said that "what is one man's food is another man's poison." One soon learns what foods do not agree with one, and so knows what food to avoid. This is purely a matter of personal experience. But old persons are often heard to say regretfully that as soon as one has learned from his own experience how to live right, it is time to die.

Rapid Eating.—One of the greatest indiscretions is rapid eating,—a fault for which Americans, as a nation, are notorious. The evils incident to this injurious habit are numerous and far-reaching. Not sufficient saliva is mixed with the food to digest it. The food is not chewed small enough to allow the digestive fluids to act upon it. The food, instead of being well chewed and mixed with saliva so that it may be easily swallowed, is forced down the throat in bulk by drinks which dilute and weaken the gastric juice. The food is forced into the stomach so rapidly and in such quantities that the stomach is overloaded before one knows it. The full taste of the food is not received by the palate, and hot sauces and condiments are used in too large and irritating quantities. So important and beneficial is the habit of slow eating that Fletcherism, so called from the sufferer from dyspepsia who discovered his own method of cure, advocates the chewing of all solids until they assume the consistency of cream, and that every substance, both solid and liquid, except water, be thoroughly chewed,—even tea and coffee passed backwards and forwards in the mouth until intimately mixed with saliva before swallowing. This practice surpasses even Gladstone's famous advice to bite every mouthful of meat thirty times before swallowing.

Irregular Meals.—Allowing too long a time to elapse between meals keeps the stomach idle for a period during which it secretes an oversupply of mucus which interferes with its efficiency. This applies to the habit

of eating a very light breakfast or of doing without lunch, and, as a consequence, the indulgence of an abnormal appetite and the overloading of the stomach at the next meal. The work of the stomach must be equalized so that its powers may not be overtaxed at any time. It is equally injurious to follow one meal too quickly by another, which has the same effect as the pernicious habit of eating between meals. When food is taken into the stomach, the blood flows freely to that part where work is to be done. If a person has been engaged in mental work, study or business, the blood has been most abundant in the brain, which was the part most actively engaged. It is therefore well to allow a little interval to elapse between work and a meal, during which time the circulation of the blood may become equalized; and for the same reason to let at least half an hour intervene between a meal and the resumption of work.

The habit of eating heartily just before retiring is undoubtedly injurious. For sleep is a period of rest intended to refresh the whole body, not merely for the limbs and brain. The stomach is as much entitled to its period of rest as are the other members of the body. Slight wonder that it rebels when much is demanded of it while the other members are resting. Still, one must not risk going to bed hungry, for that state brings wakefulness and unrest. Light food, sufficient to appease the hunger, should be taken, but not a heavy meal of such food as is hard to digest.

Moderation.—There is no doubt that as a rule we eat too much. The habits of overeating, especially at Thanksgiving and Christmas, have much to do with stomach derangements. It is not alone in the quantity of food that excesses are committed, but in the quality as well. Rich meats and gravies, highly flavored with piquant sauces to tempt jaded appetites; rich pastries, cakes, wines, and puddings; cold drinks, ices, dishes *frappé* and *glacé* to stop the flow of gastric juice at a time it is most needed; all of these imperfectly masticated and washed down with quantities of liquid to dilute the digestive fluids must inevitably cause the offender to suffer the penalty which inexorable Nature exacts—dyspepsia, biliousness, gastritis, malnutrition, constipation, diarrhœa, obesity, and gout.

Overeating.—If larger quantities of food are forced upon the stomach than it is capable of caring for, the first point to be noted is that the organs of digestion cannot cause the absorption of it all into the blood. Some of it must remain unacted upon. There is an important guard or watchman located at the lower end of the stomach, at

the opening into the bowel, whose duty it is to see that no food passes that point until it has been acted upon by the juices in the stomach and has been thoroughly subjected to all of those processes of digestion which it is the duty of the stomach to perform well. This organ of watchfulness is called the pylorus, from a Greek word meaning a gate. So long as the stomach is not overtaxed this guardian's work is well done. But when more food is taken into the stomach than can be properly cared for by it, or if food that is too difficult of digestion be presented to it, the pylorus seems to realize the futility of its objections, and offers but feeble resistance to the passage of a part of the undigested food into the bowel. The condition of affairs, then, is that a part of the undigested food remains in the stomach and a part of it passes into the intestine along with such food as has been digested. That which remains in the stomach putrefies and ferments. The results from this are disordered stomach, acidity of the stomach, fetid breath, sore throat, flatulency or wind on the stomach, wind "around the heart," a sense of fullness, and all the ills of dyspepsia quickly develop. That portion of the undigested food which passes into the intestine cannot be absorbed into the blood, and it, too, putrefies and ferments. From that follows wind in the intestines, accumulation of gases, pain in the bowels, torpor and heaviness, constipation, piles, absorption of fæcal matter, and consequent blood-poisoning. And this condition is repeated from time to time by some persons almost daily, for the mere gratification of the palate at the expense of health,—perhaps of life itself.

Deficiency of Food.—This term, in its usual significance, denotes that not enough nourishing food is taken into the system. This may be caused by a perverted appetite, which selects the wrong sorts of food, as is very often the case with children; or, even when no perversion of appetite exists, proper care is not taken that a right proportion of a particular sort of food demanded by the body is supplied. There may also be such an impaired condition of the organs of digestion that, even when good food is supplied, it cannot be properly acted upon so as to afford nutrition. This is a form of dyspepsia which brings about malnutrition.

Classification of Food.—In order to build up the several organs and to keep every part of the body in the best possible condition, four kinds or classes of foods are needed:—

1. *Nitrogenous Food.*—Such foods, as the name signifies, are very rich in the gas called nitrogen. This is so important a constituent of

food that only such matter as contains it can produce flesh or repair wasted tissue, and it is, consequently, the basis of all flesh-forming foods. Nitrogenous foods also go by the name of albuminous foods, as the type of the class is the white of an egg, which is nearly pure albumen. They are also called proteids. Other common forms of this class are casein, the chief constituent of cheese; lean meat; and gluten, which gives the tough consistence to dough.

2. *Fats.*—The fats are, chiefly, of animal origin, and are represented by fat meat, butter, lard, and the several kinds of oils. Their chief use in the nourishment of the body is the storing up of food in the form of fat; and in maintaining the heat of the body. For the latter reason they are regarded as heat-producing foods.

3. *Carbonaceous Foods.*—This group contains the starches and sugars. They are mainly of vegetable origin, and consist of cereals, peas, beans, potatoes, beets, fruits, sugar cane, etc. This class is a heat-producing group of foods, but they also aid in assimilation and in the production of fat. They contain from 40 to 45 per cent of carbon.

4. *Mineral Matter.*—This group includes water, which is chemically regarded as a mineral, lime, phosphoric acid, potash, soda, chlorine, sulphur, iron, etc. Nearly three pints of water are needed daily by an adult to dissolve the food, to carry it through the circulation, to dissolve out waste matter, to moisten the tissues, and in evaporation from the body. The body of an adult weighing one hundred and fifty pounds contains over one hundred pounds of water, or about twelve gallons. The iron in such food enriches the blood and forms a constituent of the red blood corpuscles. Lime, phosphoric acid, and carbonic acid contribute to the strength of the teeth and the bones. Absence of these food elements in a child's diet brings about the enfeebled condition known as rickets. Salt is found in the liquids and secretions of the body, such as the tears, perspiration, etc.

General Principles of Diet.—For the proper support of the body, the choice of food or the selection of menus must be based upon these broad principles:—

1. There must be a proteid constituent—a food containing nitrogen,—because nitrogenous or albuminous foods are needed to build up the essential framework of the body, which is every instant being worn out.

2. There must be salts and mineral matter, for these are present in all of the tissues and fluids of the body.

3. There must be either a fat or some article of carbonaceous food.

Although fat may be obtained from the proteids, such is not the usual source, nor could the requisite amount of fat be derived from the quantity of proteids consumed at a meal. As to the choice between fats and carbonaceous foods, it may be said that the carbonaceous foods are more easily digested than are the fats, but that the fats contain much more energy and force in a given quantity than do the carbonaceous foods.

These laws are pretty generally observed unconsciously in every meal, for we eat bread and butter, a combination of a starch and a fat; rice and milk; cheese and macaroni; and pork and beans.

Milk an Ideal Food for Children.—An appreciation of the needs of the body in these directions and a glance at the chemical composition of milk will at once make clear why it has come to be so highly esteemed as an article of food for children, and also why it is in itself a sufficiently nutritious diet during the early years.

Milk is composed of:—

Water,	87.00 per cent.
Albumen, etc.,	4.00 per cent.
Sugar,	4.25 per cent.
Fat,	4.00 per cent.
Salts,	.75 per cent.
	100.00 per cent.

It is a nitrogenous food, since it contains albumen; the starch and sugar make it a carbonaceous food; fat is present as cream; and also a percentage of mineral matter as salts. It would serve admirably as an adult food were it not for the large percentage of water which it contains. This would necessitate the taking of larger quantities than the stomach can accommodate, and so the adult takes his nourishment in more concentrated form.

The analysis of the composition of milk as given also serves to show that more than one of the four classes of food elements are to be found in a single article of diet. Food products may be at the same time both nitrogenous and carbonaceous; or both fatty and rich in mineral matter.

Need of Well Balanced Diet.—The necessity of the correct balancing of diet according to the principles stated above cannot be too strongly impressed. A violation of the laws of diet is attended not only with imperfect nutrition and a loss of bodily energy and sustenance, but it provokes a number of ills and diseases. If too much nitrogenous food, such as lean meat, eggs, cheese, gluten, etc., be taken, the liver and kidneys are overworked in their efforts to throw off the excess, and gout,

rheumatism, and other kidney and liver troubles result. Much proteid matter and too little starch and sugar cause a loss of flesh and weight because the supply of fat-forming food is deficient. If too much starch and sugar are taken, there result dyspepsia, flatulence, acidity of the stomach, corpulence, and obesity.

Value of Foods.—There is a very great difference in the nutritive qualities of the several articles of food usually consumed. The low degree of nutrition represented, by the table given below, as being supplied by milk, which has just been spoken of as an ideal food, and of turnips, and some others, is due to the relatively large amount of water which they contain. This of course reduces the value of a pound of milk when compared with a pound of olive oil, or of wheat bread. In the list here given, the common food articles are arranged in the order of their relative nutritive properties, beginning with the most nutritious. A perfect food, if such existed, would be marked 100:—

TABLE OF FOOD VALUES.

Olive oil,	96	Blood,	22
Wheat bread, baked,	95	Sole, fried,	21
Peas, dry, boiled,	93	Pork, roast,	21
Barley, boiled,	92	Flour, bolted, in bread,	21
Rice, boiled,	88	Codfish, boiled,	21
Beans, dry, boiled,	87	Peaches, raw,	20
Bread, baked,	80	Soup, barley, boiled,	20
Rye flour, baked,	79	Gooseberries, raw,	19
Oatmeal,	74	Haddock, boiled,	18
Almonds, raw,	66	Potatoes, boiled,	13
Flour, unbolted in bread,	35	Eggs, whipped,	13
Mutton, roast,	30	Strawberries, raw,	12
Plums, raw,	29	Apples, raw,	10
Chickens, fricasseed,	27	Carrots, boiled,	10
Grapes, raw,	27	Pears, raw,	10
Apricots, raw,	26	Cabbage, boiled,	7
Beef, roast,	26	Milk,	7
Cherries, raw,	25	Turnips, boiled,	4
Veal, fried,	25	Melons, raw,	3
Venison, broiled,	22	Cucumbers, raw,	2

Digestibility of Food.—The following table of the digestibility of the several articles commonly used as food, beginning with the easiest, is based upon the judgment and experience of the most eminent authorities. It will prove helpful in arranging a diet in sickness and in health:—

TABLE OF DIGESTIBILITY OF FOOD.

Food.	Time Required for Digestion.
Rice, boiled,	1 hour
Pig's feet, soused, boiled,	1 hour
Tripe, soused, boiled,	1 hour
Eggs, whipped, raw,	1 hour 30 minutes
Trout, salmon, fresh, boiled or fried,	1 hour 30 minutes
Soup, barley, boiled,	1 hour 30 minutes
Apples, sweet, raw,	1 hour 30 minutes
Venison steak, broiled,	1 hour 35 minutes
Sago, boiled,	1 hour 45 minutes
Tapioca, boiled,	2 hours
Barley, boiled,	2 hours
Milk, boiled,	2 hours
Liver, beef's, broiled,	2 hours
Eggs, fresh, raw,	2 hours
Codfish, cured, boiled,	2 hours
Apples, sour, raw,	2 hours
Cabbage, with vinegar, raw,	2 hours
Milk, raw,	2 hours 15 minutes
Turkey, wild, roasted,	2 hours 20 minutes
Turkey, domestic, boiled,	2 hours 25 minutes
Gelatine, boiled,	2 hours 25 minutes
Turkey, domestic, roasted,	2 hours 30 minutes
Goose, wild, roasted,	2 hours 30 minutes
Pig, sucking, roasted,	2 hours 30 minutes
Hash, meat and vegetables, warmed,	2 hours 30 minutes
Beans, string, boiled,	2 hours 30 minutes
Cake, sponge, baked,	2 hours 30 minutes
Parsnips, boiled,	2 hours 30 minutes
Potatoes, Irish, roasted,	2 hours 30 minutes
Chicken, fricasseed,	2 hours 45 minutes
Custard, baked,	2 hours 45 minutes
Beef, plain boiled,	2 hours 45 minutes
Apples, sour, hard, raw,	2 hours 50 minutes
Oysters, fresh, raw,	2 hours 55 minutes
Eggs, fresh, soft-boiled,	3 hours
Bass, fresh, striped, broiled,	3 hours
Beef, fresh, lean, rare, roast,	3 hours
Pork, newly salted, stewed,	3 hours
Mutton, fresh, broiled,	3 hours
Soup, boiled,	3 hours
Chicken soup, boiled,	3 hours
Dumpling, apple, boiled,	3 hours

TABLE OF DIGESTIBILITY OF FOOD.—Continued.

Food.	Time Required for Digestion.
Corn cake, baked,	3 hours
Oysters, fresh, roasted,	3 hours
Pork steak, broiled,	3 hours 15 minutes
Mutton, fresh, roasted,	3 hours 15 minutes
Corn bread, baked,	3 hours 15 minutes
Carrot, boiled,	3 hours 15 minutes
Sausage, fresh, broiled,	3 hours 30 minutes
Oysters, fresh, stewed,	3 hours 30 minutes
Butter,	3 hours 30 minutes
Cheese, old, strong,	3 hours 30 minutes
Soup, mutton, boiled,	3 hours 30 minutes
Oyster soup, boiled,	3 hours 30 minutes
Wheat bread, fresh, baked,	3 hours 30 minutes
Turnips, boiled,	3 hours 30 minutes
Potatoes, Irish, boiled,	3 hours 30 minutes
Eggs, fresh, hard-boiled,	3 hours 30 minutes
Green corn and beans, boiled,	3 hours 45 minutes
Beets, boiled,	3 hours 45 minutes
Salmon, salted, boiled,	4 hours
Beef, fried,	4 hours
Veal, fresh, broiled,	4 hours

Arranging a Diet.—By reference to the foregoing tables of nutritive values and of the digestibility of foods, the selection of a suitable diet for special cases will be greatly facilitated.

These tables should be read together in making a choice of food. For it is plain that a food may be highly nutritive and yet very difficult to digest. Such a condition is worse than a food of medium nutritive quality and of easy digestion. No table of the digestibility of food can be arranged which will be true for every individual. Personal peculiarities, idiosyncrasies, and more or less impairment of the digestive organs, all operate as factors which are hardly capable of being accurately estimated. One's own experience must be a modifying element in all selection.

There are, however, other considerations, besides nutritive and digestible qualities of food, to influence a careful and competent selection.

Diet Governed by Climate.—The influence of climate and the seasons, in deciding the sorts of food which should be chosen, is of prime importance. In cold climates and in the winter season there is great need of the heat-producing foods, the fats and the carbonaceous foods.

Almost incredible quantities of oil, blubber, and fat meat are reported to be consumed in the diet of the Esquimaux and other arctic inhabitants. Dr. Hayes, the arctic explorer, says that the daily ration of the Esquimaux with whom he came in contact was from twelve to fifteen pounds of meat, one-third of it fat, to each person. He saw one man eat ten pounds of walrus meat and blubber at a single meal. Such instances must not, however, be regarded as gluttony on the part of these people, but as the requirements of the body for fortification against the rigors of the climate. On the other hand the inhabitant of the tropics subsists almost wholly upon a diet of juicy, watery, cooling fruits.

Our diet, then, in winter should be largely carbonaceous food, comprising meats, fats, and oils, in abundance. In summer it should consist of a liberal allowance of fresh vegetables and fruits. Fortunately Nature contributes to make such an arrangement easy, as the summer season is one of abundance of the very foods most desirable at that time.

Diet Governed by Age.—In youth, during the growing period, the repair or upbuilding of the tissues is greater than the waste; in middle life the repair and waste are about equal; and in old age the waste is greater than the repair. Therefore, it may be briefly concluded that the diet of young persons should be largely of a vegetable nature and of a more nourishing kind than the diet of old age.

Diet Governed by Occupation.—Occupation is intended to represent the amount of manual work performed or the amount of exercise taken; which must be provided for in the selection of a suitable diet. When great muscular exertion is required, nitrogenous foods are to predominate in the diet, for they are the foods that rebuild the muscles that are worn down by use. In sedentary occupations carbonaceous foods are to abound. The appetite is a great regulator in such cases. If the wrong sort of food is presented, according to the needs of the body, or of a particular case, that food will be partaken of in large quantities in the effort to get a sufficient quantity of the required nourishment. This unsatisfied need of the body, in a measure, explains the possibility of a person eating heartily of food with apparent good appetite, and yet complaining of feeling hungry. This is an almost sure sign that a change of diet is needed. It will also be realized that the excessive amount taken in the effort to satisfy the natural craving of the appetite entails a lot of unnecessary work upon the digestive organs.

Change of Conditions.—One should be always watchful to adjust the diet to a change of occupation or of climate. Where one has been

leading an active life of manual labor or of much exercise, and then changes to a sedentary occupation, one must not expect to maintain the same dietary supply as formerly, but must endeavor to adapt the diet to one's new needs as quickly as possible. It may be that even with one's best efforts in this direction there will be a period of greater or less disturbance in the endeavor to meet the new requirements.

Pure Food.—An important duty in connection with the supply of food is the exercise of that care in its selection which is necessary to procure articles of good quality and of insured purity. Government inspection of meats, and of food generally, does much in the way of regulating the sale and the supply of food. But even the best efforts of inspectors do not prevent goods of poor quality and even of impurity from being offered for sale. Ptomaine poisoning results from eating tainted meat or poultry. Tapeworm is transferred from the flesh of the pig and ox to the human body, and the well known disease of trichiniasis is communicated to man from a parasite in pork. Parasites in meat, capable of communicating disease to man, are certainly destroyed by thorough cooking. At least it is the requisite degree of heat throughout the entire portion of the meat that kills the germs. But tainted meat, poultry, and fish are not rendered harmless by cooking; and oysters and other shellfish eaten raw have often been the means of communicating dangerous diseases. Milk is recognized as a means of spreading disease; and, as a precaution, all milk is, or should be, pasteurized. In this process the milk is heated to 160° Fahrenheit, at which temperature the germs of disease which it may contain are killed. Many cases of fatal poisoning have resulted from the careless habit of opening canned goods, using a part of the contents, and leaving the remnant in the opened tin for future use. This is lead poisoning caused by the fruit acid acting on the solder of the tin in the presence of oxygen in the air. As soon as a can of goods is opened, the contents should be at once removed to another vessel, if it is not intended for immediate use or cooking. The same effects have resulted from eating ice cream which has become affected in a similar way.

How to Detect Impure Food.—Adulteration of food is quite common. The methods of detecting some of these cheap and harmful compounds are extremely simple and can be performed by anyone. It is a great satisfaction to know something of the purity of the articles of food which one is using. It is a well understood fact that when it is generally known that one has a pair of scales in the house, one is very

likely always to get full weight. So when one has even a slight reputation as a domestic analyst, there is small likelihood that an inferior article of food will be offered.

To examine a specimen of coffee, take the whole bean. Many believe that it is only the unground coffee that is free from adulteration, and that by having a mill at home they will insure a purer article. It may surprise such to know that the coffee bean is adulterated with artificial coffee beans or pellets which are made from wheat bran roasted and from chicory. To detect these, take a cup of water and put into it a few of the whole beans. The genuine coffee beans will float on the top of the water while the adulterants will sink to the bottom. Then take some of the ground coffee and try it in the same way in another cup of water. The grains of pure coffee will float and will not color the water for some minutes. The grains of chicory and cereals will sink to the bottom and will leave a colored trail behind them as they fall.

There is another test for ground coffee, which depends simply upon examination by the unaided eye. Spread some of the grains upon a piece of writing paper and examine them closely. Genuine coffee grains are of a dull color. They also have the coffee taste. Chicory grains are dark colored and have an appearance like that of gum. When tasted they are found to be very soft and bitter. Grains of cereal have a smooth and polished surface and are devoid of taste.

Honey, jams, jellies, syrups, and similar preparations often depend for their sweet taste upon the presence of glucose. This is a very cheap substitute for sugar, and is made by treating cornstarch with an acid. To detect the presence of glucose in any preparation a very strong alcohol is required. Pour a small quantity of 95 per cent alcohol into a tumbler. Then take a spoonful of the substance to be tested and slowly pour it into the alcohol. If glucose is present the alcohol will show a milky color, and a thick substance like gum will settle on the bottom of the glass. The milky appearance of the alcohol will remain for a long time. But if no glucose is present a white flaky sediment will settle to the bottom of the glass, and in a few minutes the alcohol will be quite clear.

Many jams, jellies, syrups, tomato ketchup, and the like, owe their brilliant color to the use of a dye, generally an aniline dye. The test in such cases is simply to learn whether or not the suspected substance will dye a piece of woolen goods. Take a small quantity—two or three spoonfuls—of the suspected substance and stir it into rather less than a pint of water. Place this in a stewpan. Take a small piece of all-wool

white goods such as nun's veiling, and pour boiling water over it until it is thoroughly saturated. Then place it in the solution and boil it for about ten minutes, stirring it meanwhile. If there is any dye present it will impart a bright, vivid color to the piece of goods. Natural juices from fruit are of a dull or dead color. If there is any doubt of the character of the stain on the cloth, boil the dyed cloth with a tablespoonful of ordinary ammonia in a pint of water for five minutes. Then remove the cloth; add a few tablespoonfuls of vinegar to the ammonia; put in a new or clean piece of cloth, and boil again for five or ten minutes. If the new piece of cloth is colored there is aniline or other dye present. The explanation is that the color was extracted from the first piece of cloth by the ammonia, and when the vinegar was added and the clean piece of cloth boiled in the discolored ammonia, the dye was imparted to the cloth. If the coloring matter in the first piece of cloth were only the natural juice of the fruit, it would not have been removed from it by the ammonia. This experiment will prove the presence of a dye in any article of food.

The presence of coloring matter in milk may be detected by allowing the cream to rise and then comparing the color of the cream with that of the milk. In natural colored milk the cream is always more yellow than the milk from which it rises. If the milk is as yellow or more so than the cream, there is little doubt that a yellow coloring matter has been added to make up for some deficiency in the quality of the milk.

To test the purity of butter, take a piece as large as the end of one's thumb. Place this in a spoon and heat it over the flame of an alcohol lamp or a candle. After it has melted, lower it into the flame so that it will boil. Stir it well during the boiling. If the sample is butter, the boiling will be attended with very little noise, and there will be a great deal of foam; oleomargarine or artificial butter will boil very noisily and there will be very little foam. Another test is applied by taking a tin cupful of sweet milk and placing in it a small lump of the butter. Heat the milk and stir while the butter is melting. Then place the cup in broken ice so as to cause it to cool rapidly. Now observe the action of the sample while cooling. If it is butter the mass will form small grains as it does in the churn, and cannot be gathered together in a lump. Oleomargarine or artificial butter will gather in a mass.

To test vanilla flavoring extract, place some in a small bowl and set it in the top of the teakettle. Allow it to boil or evaporate until there is only one-third of the original volume. Then add water enough to

make up the original quantity. If there is a red, flaky sediment in the bottom of the bowl it is vanilla of good quality. If there is no sediment, the article is artificial.

To test the purity of lemon flavoring extract, take a tumblerful of water and add a teaspoonful of the lemon extract to it. If there is a cloudy appearance communicated to the water, the extract is artificial and there is no pure lemon oil present. If there is reason to suspect that the liquid is colored artificially, and not by the rind of lemon peel, the dyeing test given above may be used.

To test for the presence of alum in baking powder, get a few chips of logwood and pour water upon them and boil. Pour off the liquid and add more water and boil again. Repeat this so as to get the fourth water. Add a teaspoonful or two of the baking powder to a half tumblerful of water. Then add two tablespoonfuls of vinegar and pour in two or three drops of the extract of logwood. If alum is present the solution will turn reddish blue. If there is no alum the solution will be yellow.

The first quality which milk should possess is that of cleanliness, not only as a direct essential to health but in order that the milk will keep. Cleanliness is the best preservative, and, indeed, the only one that is really permissible outside of temperature. It is a difficult matter to detect an impure condition of milk resulting from this necessary lack of care. The senses of sight, smell, and taste are reliable guides so far as they go; but a sample of milk may easily pass these guards and yet be wholly unfit for use. The reputation of the dealer is about all that one can go on in that case. The commonest form of adulteration, if it can be regarded as adulteration, is the reducing of the strength of the milk by (1) the addition of water, (2) the addition of skim milk, or (3) the removal of cream. This dilution can easily be detected by the use of the lactometer, which is a simple, inexpensive instrument for ascertaining the density or specific gravity of milk. It will tell whether the cream has been removed. A simpler test is to pour some fresh milk into a glass and set it aside to allow the cream to rise. The amount of cream which forms is an indication of the strength of the milk. By using samples from several sources, one can easily select the richest. If milk spoils without souring, a preservative has been used. It is safe to say that all preservatives are injurious. The commonest in use are borax or boric acid, salicylic acid, and formaldehyde. These are all preventives of the growth of the germ which causes milk to sour, and are undesirable constituents of food, especially for young children.

The safest way to guard against injurious canned goods is to make it a rule to accept no cans which do not bear the name of the packer. The greatest danger arises from the too common custom of cleaning up old stock and putting on a new fresh wrapper in bright colors, attractively printed, but bearing no name of the person upon whom responsibility can be placed. A man who is ashamed to have his name appear upon his product is unworthy of patronage.

Unripe Fruit.—Eating unripe fruit, a common practice with children, is often the direct cause of diseases of the digestive organs. Much disturbance of these organs is also caused by eating too heartily of new fruits and vegetables. When such first come in season the system is not prepared for them, and they should be used moderately and with caution. The dangers seem to be lessened considerably in these days of cold storage, which not only insures a riper grade of fruit than was possible formerly, but the season for all fruits and vegetables has been vastly extended by its use.

Constitution and Temperament.—In all families the diet should be arranged so as to suit the constitution and temperament of each one of its members. If, as is too often the case, the menu is prescribed to suit the taste, occupation, and age of the father of the family, it is unreasonable to expect the anæmic girl or the nervous boy to be properly nourished or satisfied with it. When such is the case, the unreasonableness of it all is increased by a, perhaps, well-intentioned effort to force the children to partake of some of the dishes for which they have expressed a distaste. It is not merely a matter of kindness to prepare a special dish for one or more of the younger members of the family, but it really is imperative that such be done. No thoughtful mother will allow considerations of extra work and cooking to prevent this attention to the needs of her children.

Those of a sanguine temperament require a moderate quantity of simple food. They should avoid the use of sauces and condiments, pepper, and highly seasoned food. Stimulating drinks are also to be excluded from their diet.

Those of a lymphatic or phlegmatic temperament require an abundance of nourishing food, with a good supply of animal food, fresh vegetables and fruits.

Those of a bilious temperament are so subject to derangements of the digestive organs that the question of their diet is often perplexing. Easily digested, well cooked food of high nourishing quality is essential.

Those of a nervous temperament are also extremely difficult to provide for. If the food is not rich enough, impure blood is sent to the brain, the seat of the nervous system, and nervous derangements will surely be aggravated. If the food is too stimulating, or if too substantial a diet be supplied, the blood becomes too much enriched, and therefore too stimulating and exciting, which is the very condition sought to be avoided in these cases.

Good Cooking.—A great advance has been made in recent years in the art of cooking. There is now little truth in the assertion that much good food is spoiled by bad cooking. It is more nearly correct to say that inferior food is often improved by good cooking. Every year shows a decided advance in the science and art of preparing food. This is to be regarded as a great improvement in hygiene and health. It is possible, however, that great skill in the preparation of appetizing and savory dishes may be responsible for many cases of excesses in eating.

Abstinence.—There are times when it would be vastly better to miss a meal than to eat one. When one approaches a meal hour without a desire for food, one should not let habit force one to partake of the food. Judicious abstinence on occasions is one of Nature's own means of self-defense. Highly seasoned dishes with savory sauces are often a spur to a jaded appetite caused by surfeit and over-indulgence.

Concentrated Foods.—There are a great many concentrated foods on the market for which great claims are made by the manufacturers. It must be remembered that there is a limit to concentration, beyond which the value of the article as nourishing food is more than doubtful. The common statement that a lozenge of concentrated food contains as much nourishment as a beefsteak is not only untrue but absurd. Some go so far as to claim that a few lozenges contain all the nourishment which an adult will require for an entire day's sustenance. This claim is equally absurd and untrue. For the weight of chemically dry, water-free food which an adult requires in a day while in a state of perfect rest is 16 ounces; while engaged in ordinary work, 22½ ounces.

When highly concentrated, predigested food is presented to the stomach in a state of health, that organ seems to resent the premature interference with its duties. There results a loss of appetite and either diarrhœa or constipation. It is also clearly established that the digestive juices require something undigested to work upon; and considerable bulk of food is also required for the proper distention of the stomach and bowels, in order that these organs may properly discharge their several

functions. The fact that some of these concentrated foods may be not only highly beneficial but absolutely indispensable in some forms of disease is no proof that they are a fit food in a state of health. Their greatest recommendation is the fact that they are easily carried by those who are obliged to transport quantities of food in small space to remote parts of the world.

Daily Ration in Health.—The distribution of the food elements, the quantity of food required by an adult in a state of health, and the variety of the food, may, perhaps, be best illustrated by the daily ration served to each soldier in the United States army. On comparison with the daily ration of soldiers of the armies of other countries, this is said to be the most generous allowance to any:—

Bread or flour,	22 ounces.
Fresh or salt beef,	20 ounces.
Or pork or bacon,	12 ounces.
Potatoes, three times a week,	16 ounces.
Rice,	1.6 ounces.
Coffee,	1.6 ounces.
Or tea,	0.24 ounces.
Sugar,	2.4 ounces.
Beans,	0.64 gill.
Vinegar,	0.32 gill.
Salt,	0.16 gill.

THE WATER WE DRINK AND ITS EFFECTS.

Absolutely pure water has no color, taste, or odor, and is composed of two parts of hydrogen gas and sixteen parts of oxygen gas by weight. Natural water is classified as follows: Rain water, spring water, river water, lake water, and sea water. These, however, are never found chemically pure; only distilled water is such. The impurities found in water are either solid or gaseous; and are either suspended in it or are dissolved in it.

Rain water is the purest of all natural waters. It always contains gases dissolved in it, especially nitrogen, oxygen, carbon dioxide, and ammonia gas. These are washed out of the atmosphere as the rain falls through the air. Ice water in the form of melted ice is purer than rain water, for, in the process of freezing, the solids and gases are expelled.

Spring water is rain water which, in its passage through the earth, dissolves out of the soil, and unites chemically with certain substances which produce the mineral ingredients found in spring water. There are common springs which yield fresh water, mineral springs which supply mineral water, and thermal and medicinal springs. Well water, when obtained from a deep well, is much the same as spring water. But surface or shallow springs and wells yield, usually, polluted or contaminated water by reason of the surface drainage into them and the imperfect filtration, as the water does not pass through deep layers of soil in reaching them. If there is much mineral matter contained in water it is said to be "hard"; if only a slight quantity, it is called "soft." Hard waters do not make a good lather with soap; and sea water none at all.

River water partakes very largely of the nature of the soil over which it flows. There is always a large percentage of organic matter contained in river water, which is washed into it from the surface of the ground.

Lake water varies greatly in mineral matter, and includes salt lakes, like that of Utah and the Dead Sea, and all the modifications of these down to the freshest and clearest of waters. As the water in a lake is not so much subject to agitation as it is when flowing in a river, much of the suspended organic matter of the river water subsides and falls as a sediment to the bottom of the lake, leaving the water clearer and less turbid. Lakes, therefore, are natural reservoirs and are among the best sources of a good water supply.

Impurities of Drinking Water.—The gases and minerals dissolved in water are not all harmful or disagreeable. Indeed, many of them remove the insipid taste of distilled water. Besides the gases and dissolved mineral matter we find certain solids suspended in the water or falling to the bottom as a sediment when at rest. These are minute particles of clay, sand, etc.; vegetable and animal matter; and living organisms. Micro-organisms, or bacteria, are found in large numbers in all water, except spring water, which has passed through a deep layer of fine soil, by which means the bacteria are filtered out. These micro-organisms vary in number from two in a cubic centimeter of water drawn from an artesian well to thirty-eight million in a cubic centimeter of sewer water. There are more bacteria in water during hot than during cold weather. These germs find their way into the water from both the air and the soil. Under favorable conditions they multiply very rapidly in water. The fact that micro-organisms are found in water does not mean anything, for they are found in all water; nor is it important

that there are few or many; but it is of the utmost importance to ascertain whether or not they are the bacteria of any specific disease, and whether or not they are characteristic sewage or surface drainage germs. The determination of these points decides the purity or impurity of the water.

The refuse from some mills and certain manufactures, when allowed to escape into rivers, are also frequent sources of pollution and contamination of water.

The pipes by which water is conveyed sometimes yield such impurities as lead, zinc, or iron; and wooden pipes, in the process of decay, impregnate it with dead organic matter.

Leaking sewer and gas pipes, and the drainage from cesspools, are common causes of impurity of water. A curious instance is known where a sudden diminution of the water pressure in water pipes created a partial vacuum within the pipe and sewer air or water was sucked into the water pipes, resulting in an epidemic of typhoid fever.

Effects of Impurities in Water.—Sewer gases, when dissolved in water, are known to produce diarrhœa, as does also hydrogen sulphide gas, a constituent of illuminating gas. Some of the "hard" waters produce calculus, or stone in the bladder. Lime salts in water produce dyspepsia, as does iron, with the additional effect of constipation. Dissolved vegetable and organic matter produces fevers and diarrhœa. Turbid water, containing particles of clay, vegetable matter, and the like, causes diarrhœa, dysentery, and, sometimes, fevers and cholera.

Tests for Drinking Water.—The chemical, microscopical, and bacteriological tests for drinking water are, of course, a matter for the trained specialist. But there are a few physical tests which anyone may easily apply. The points to be noted are:—

1. *Color.*—The water under examination should be allowed to remain at rest for a time in order that any sediment may settle to the bottom of the vessel. The clear water above is then to be poured into a clean glass vessel, and a sheet of white paper is placed behind or below it. In this way the color is noted. To do this properly the glass vessel should have a diameter of at least eighteen inches. If a glass vessel containing distilled water be placed beside it for comparison a better result will be reached. A bluish tinge characterizes perfectly pure water; a grayish tinge is not objectionable; a greenish tinge may result from harmless algæ, or water plants; yellowish or brownish hues result from iron salts, peat, animal matter, or sewage.

2. *Clearness or Turbidity.*—The water should then be well shaken up so as to distribute the sediment, and a printed page should be placed behind or below the glass vessel so as to estimate the depth of water through which the page may be read. If the turbidity does not subside after the water has stood at rest for some time, it is caused by finely divided particles of clay.

3. *Sediment.*—This may be classified approximately, as: absent, minute, slight, large, or very large. Some idea may also be given of its nature, as: sandy, clayey, reddish; and the presence of any large particles of organic matter, as chips, minute fragments of leaves, grass, etc., may be noted.

4. *Luster.*—If highly aerated, the water sparkles. Polluted river or well water, or stagnant water, has no luster.

5. *Taste.*—A good tasting water may be impure; but a bad tasting water should be unhesitatingly condemned.

6. *Smell.*—Slightly heat the water and then observe the odor, or the absence of it. When water is heated, the gases are liberated and the odor is much more pronounced than when cold. A bad odor is another cause for the immediate rejection of a water. But the absence of odor is not in itself a proof of its purity. Generally speaking, a water that is colorless, clear, free from sediment, sparkling, and devoid of taste or odor may be regarded as safe to drink.

To Purify Water.—The safest and most convenient methods of insuring good water in the home are filtration and boiling. The process of filtration most generally employed is that of some mechanical method where the filter employed contains either sand, porcelain, asbestos, or some form of carbon or charcoal. The great objection to the most effective methods of filtering is the slow delivery of the filtered water; and, while the water delivered may be clear and apparently fit for use, there is no assurance that the germs of disease which the water may have contained are removed. The great safeguard, then, is to boil the water. While this is an effective means of killing all disease germs in the water, it has the objectionable effect of driving off the gases dissolved in the water and thereby rendering the water insipid and unpalatable. In cases of suspected impurity of water, and during seasons of epidemic, it is very largely the custom to procure a table water of known purity and free from all taint. These are usually of certified chemical constitution, and are often both palatable and medicinal. After water has been boiled and the gases driven off, it is possible to aerate it again

by pouring it backwards and forwards through a fine sieve so as to divide it into many small streams, and while thus exposed to the air it will absorb oxygen. If the water is only turbid, it may be allowed to settle, and the clear water carefully poured off. Hard water may be improved for drinking purposes by the addition of a little limewater.

Mastication and Insalivation.—That the mouth by local care be kept in a normal, healthy condition is by no means of purely æsthetic interest. It is of vital importance to our general health, as indeed in many cases of severe and even serious dyspepsia the cause lies no deeper than the mouth, and the patient needs not pills for his stomach, but pellets for his decaying teeth. And while the field of medicine of to-day is broad enough without specializing in dentistry, every man who busies himself with the treatment of alimentary diseases should know enough about the teeth to be able to tell when the patient has mistaken the doctor's door for the dentist's.

Among the various functions which are performed in the mouth, such as taste and the articulating of speech, we have one very important adjunct to the process of digestion. By the use of our teeth, cheeks, and tongue we chew our food and mix it with saliva, performing the functions of mastication and insalivation, constituting the first two steps in the process of digestion. And only after these two are thoroughly carried out should deglutition or swallowing occur. These three voluntary acts are the only parts of digestion and nutrition over which we have any control, and it is ours to see that they are carried out in the most perfect manner, for here is the starting point of good digestion or of a dyspeptic constitution, as we choose to make it. Failure in this causes the whole body to suffer, for the stomach will receive food too coarse to act upon it. If it is not properly insalivated by the action of the saliva, it will pass it on to the intestines in such a condition that they in turn will be overworked, causing a general derangement of the various organs of assimilation and excretion, bringing about such maladies as are of grave constitutional importance by producing a condition of what is known as malnutrition. This is in the case of a large number of diseases a predisposing cause which can be traced to improper chewing and insalivation of our food.

And while the serpent bolts his fly, the bird its grain, and the fish its brother without the ceremony of chewing, Nature has imposed upon us the work of mastication to meet the requirement of our higher organization, and in no other particular is the perfection of creation more

beautifully illustrated than it is in the adaptation of the various forms of teeth for the various purposes for which they were designed.

Thus in the carnivora or flesh-eating animals, which spend but a short time in mastication, their teeth are in general adapted rather for tearing and cutting than for grinding, while in ruminating animals, whose teeth work all day long, most of them are especially adapted for grinding. But where the diet is partly animal and partly vegetable, as in man, the teeth are fitted for performing all kinds of work,—the front teeth being designed to cut, as they are sharp, and, in overlapping the lower teeth in closing, as the normal meeting of the teeth provides, they perform the work of a pair of shears, from which the name incisor (to cut) has been applied to them. Their immediate associates, the cuspids, commonly called eye and stomach teeth, being pointed, are adapted to the work of tearing, leaving the work of grinding to be done by our molars and bicuspids, whose broad, but uneven surfaces are so well adapted to complete this important function of mastication.

In man there are two sets of teeth: the deciduous (from *de* and *cado,* to fall) or temporary teeth, sometimes called milk teeth, and the permanent teeth.

The deciduous teeth are twenty in number—ten in the upper and ten in the lower jaw—and consist on each side of four incisors (from *incido,* I cut), two canines or tearing teeth (from *canis,* a dog), so called because they are well developed in the dog. They are scientifically called cuspid teeth (from the Latin *cuspis,* a spear), and four molars or grinding teeth (from the Latin *mola,* a mill), so called because they are for grinding purposes.

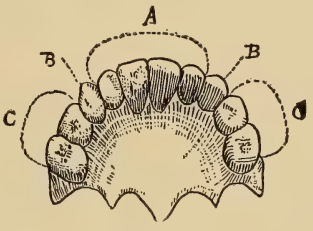

FIG. 1.
TEMPORARY OR DECIDUOUS TEETH.
A. Incisors. B. Canines or Cuspids. C. Molars.

Each of the deciduous teeth is, in the course of time, replaced by a permanent tooth, but not of the same denomination throughout, for the baby molars are succeeded by teeth which are now called pre-molars (from the Latin *prae,* before), meaning before molars, so applied because in the dental arch they come in rotation before the permanent molars as regards their position, but they are more commonly called bicuspids, having two cusps. And, in addition, the vacant portion of the gum back of the baby teeth is now filled up by twelve teeth, six on each side, three

above and three below these twelve permanent molars; they raise the number of the permanent teeth to thirty-two. And from before backward on each side, above and below, they are given the names of the first, second, and third molars. The last or third molar is more commonly called the wisdom tooth.

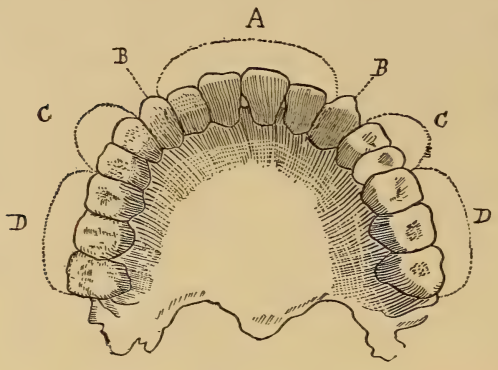

FIG. 2. PERMANENT TEETH.
A. Incisors. B. Canines. C. Bicuspids. D. Molars.

Structure of Teeth.—Each tooth contains four structural substances: the enamel; the dentine; the cementum; and the pulp. The enamel, which forms the outside shell of the crown, is the hardest substance within the body, being composed almost entirely of earthy or mineral (about 97 per cent), is made up of rod-like structure called enamel prisms, which radiate outward from the surface of the dentine at all points, being thickest at the grinding or cutting edges, and becoming thinner as it approaches the necks.

The dentine represents the interior or middle portion of the tooth throughout its entire length. Its structure is similar to that of bone, but is harder and more dense. Dentine contains about 72 per cent of mineral matter, but is not nearly so hard as enamel.

The cementum is the external covering of the root, completely enveloping it as the enamel does the crown, and in structure it very much resembles the dentine.

The pulp is the formative organ of the dentine. It occupies the central portion of the crown and root at about their junction, narrowing down gradually into a few nerve fibers and blood vessels, which pass out through the end of the root to connect with the large nerve trunk and blood vessels, of which it is a tributary part. This tissue is of much importance to the tooth because it is from this structure that it receives its blood supply and nerve vitality—its nourishment.

The pulp tissue represents the incalcified portion of the original tooth germ. It is a highly organized, consequently an extremely sensitive tissue, and, when exposed by decay to the action of foreign bodies and to heat and cold, it is the source of excruciating pain.

Causes of Decay.—It has been claimed upon very good reasoning that if it were possible to keep our teeth absolutely clean upon all surfaces and at all times, there would be no decay of the teeth. Discussions at length have been held regarding the theory of decay of teeth, but present-day scientists seem to agree that it can be laid to the chemical and bacteriological theories alone, these two never working independently. There is always an abundance of bacteria in the mouth, and in their presence there can always be found left an acid condition as their waste product, which, by its action to dissolve bone structure, penetrates the enamel, leaving a new surface with fresh organic matter for food for bacteria, which work together for the destruction of our teeth.

The enamel, as above stated, contains only 3 per cent of organic matter, which is not enough to support bacterial life in itself, but when once the dentine is penetrated there is 28 per cent of organic matter in it, presenting a feeding ground for the millions of bacteria which inhabit the mouth. Under these most favorable conditions of heat and moisture they will multiply and thrive, still burrowing deeper until the pulp, being exposed, gives the possessor a gentle hint of the presence of a diseased tooth, which, when examined by the dentist, will probably require the removal of a nerve, causing the tooth to lose its transparency, as well as to make it brittle. Teeth should not be neglected until Nature warns us by pain, and the sooner people become educated to this fact the better will be the service they will receive from their dentists.

Decay begins on the surfaces of the teeth and not on the inside or at the roots, as so many people erroneously believe. It begins, first, in crevices within the surface due to improper union of the enamel, which, being developed in segments, sometimes fails to form a proper and thorough union; second, it commences on surfaces which rest against other teeth where particles of food, principally of a starchy nature, lodge, and their inacessibility to a brush or other means of cleansing causes them to undergo a process of fermentation and decomposition and consequent disaster which follows. The usual point at which this condition is found is just above their contact points.

Cleaning the Teeth.—Our teeth should be cleansed after each meal, and at least once a year by the dentist, who at this time can examine them thoroughly.

Sometimes people flatter themselves with the thought that a tooth in which the nerve has become exposed by decay and has subsequently died of its own accord, will ache no more; but here begins the founda-

tion for some of the most serious complications I have ever seen, as it is the starting point for a developing abscess of the jaw, which sometimes proves very disastrous. I have in mind now a case of this kind which came to a public clinic with which I was connected at the time, and which was the direct cause of the patient having the entire lower jaw removed, defacing her expression in a most ghastly manner for life.

Dead Teeth should either be extracted or thoroughly filled to be in a safe condition to keep in the mouth, and should be considered as dangerous organs to be retained in the mouth, both by reason of their poisonous influence to digestion and of the danger of an alveolar abscess, which is liable, under favorable conditions, to develop at any time.

Filling Teeth.—Teeth should be filled for their preservation so long as fillings can be retained in them, for crowning teeth must be resorted to as a last attempt to save them, as crowned teeth have a fixed and almost uniformly definite period of usefulness, which is ordinarily about fifteen to twenty years, oftener a much shorter time, when they become loosened by absorption and fall out, to be replaced by an entirely artificial substitute, and, as a wooden leg is better than no leg, so artificial teeth are better than no teeth, likewise a glass eye, a wig, a rubber nose, but the loss of the organ is none the less deplorable.

THE CARE OF THE SKIN.

The Skin and its Functions.—Because it is so active in throwing off refuse matter from the body, the skin has been described as the third lung. Its further uses are protective and absorbent. There are two layers of skin: the outer or scarf skin, sometimes called the cuticle; and an inner skin, known as the true skin. The outer skin scarfs off in the form of dandruff and small scales. This explains why stains, such as that of iodine, so soon disappear. The skin is provided with two sets of glands: oil glands, which secrete a sort of oil to keep the hair oily and the skin soft and pliable; and perspiration glands, or pores, through which the perspiration passes and by which liquids are absorbed. The oil glands secrete a sebaceous matter which sometimes clogs up the glands and collects dirt, forming the unsightly blackheads. They are not found in those parts of the body which are devoid of hair, such as the soles of the feet and the palms of the hands. The perspiration glands

are extremely fine tubes, over two and a half millions in number, distributed over all parts of the body. They are most numerous on the palms of the hands, and least so on the back of the neck and of the body. Perspiration, called insensible when it cannot be seen, and sensible when it forms drops, is constantly passing off from the body at the rate of about two pounds of liquid every day. If it is suddenly and temporarily checked, painful and dangerous results ensue; if permanently checked, death quickly follows. Actual breathing of oxygen gas and expulsion of carbon dioxide is carried on through the pores of the skin in the same manner as by the lungs. If all of the pores be closed so as to stop this process, death by suffocation will follow. This actually occurred in the case of a little child in a festival celebration at Rome, whose body was completely covered with gold leaf to represent the golden glory of an angel. Death followed in a few hours from suffocation by stopping the exhalations of the skin. Painter's colic is caused by the absorption of lead from the paint through the pores in the palms of the hand. The use of liniments containing opium is very dangerous, as the poison is absorbed by the skin, especially by raw surfaces. This absorbing power is active when the chest is rubbed with oil, or when skin food is applied to the body. The only way in which the pores of the body can be kept open and the activity of the skin insured is by frequent bathing.

Baths and Bathing.—A state of good health cannot be maintained or secured unless the skin properly performs its several functions. This is impossible unless the skin is kept scrupulously clean. The cleansing process includes the removal of not only the accidental dirt but of the accumulated excretions of the skin itself. Part of the excretions are volatile, and either pass off into the air or are absorbed by the clothing; and another part is non-volatile and can be removed from the skin only by washing. As this non-volatile part is very largely fatty in its nature, it cannot be thoroughly and effectively removed without the use of soap. As fatty matter is more soluble at a high temperature than at a medium or low temperature, warm water is more cleansing than is cold water. Friction by means of a flesh brush or by a rough towel is a great aid in the cleansing process.

Cold Bath.—A cold bath is one in which the water is below 60° Fahrenheit. Such baths abstract heat from the body, but, except in cases of very high fever, not to an extent appreciable by a thermometer, because the loss of heat by the body is made up by the increased heat production. This heat production is caused by, or produces, increased waste of tissue,

or change of tissue. More carbonic acid is given off by the lungs; the pores of the skin are closed; the heart's action is at first quickened and then diminished; and breathing is more rapid. The vigorous rubbing with a rough towel, which should instantly follow a cold bath, dilates or opens the pores of the skin, and a general stimulating and invigorating sensation follows. The cold bath regularly taken, opens and closes the pores of the skin, and the power which the pores acquire in this respect render cold bathers little liable to take cold. Such are the good effects of a cold bath that is neither too cold nor too long continued, and upon the person of one who has sufficient vitality to react from the shock. Cold baths should not be taken by the very young, the very old, by those weakened by illness or disease, or by those already suffering from congestion. Those who suffer from disease of the heart should take only temperate baths. To those who can stand a cold bath, it should be the rule of their lives to take one daily, partly to cleanse the skin, and partly for the tonic effect upon the skin in particular, and to the whole body generally. The best time of day for the full wash is on rising in the morning. The body is then warm and better able to stand cold water than at any other time of the day; the muscles are relaxed by sleeping and the cold bath is bracing.

Warm Bath.—A warm bath is one in which the temperature of the water is over 60° and under 90° Fahrenheit. It dilates the pores of the skin and causes more rapid breathing. On leaving a warm bath the pores are still open and the perspiration is increased. There is then great need of care lest a chill be taken. The blood is withdrawn from the internal organs, and a sedative effect upon the whole body, with a feeling of sleepiness, is noticeable, so that a warm bath at bedtime is advisable in cases of insomnia or sleeplessness. Too frequently indulged in, warm baths are enervating, and the danger of taking cold is very great; but a warm bath is more cleansing than a cold bath, and after excessive exertion is useful to relieve the sensation of fatigue. It is best taken at night before retiring.

Sea Bathing.—Sea bathing has all of the virtues of a cold bath with the added benefits of the moving water and the probable slight stimulating effect of the salt. The best time for a sea bath is about two hours after breakfast, and the bath should last not more than five minutes for those who cannot swim, and about ten minutes for those who can; in no case for more than fifteen minutes. The feeling of chilliness should be the signal for instant retirement from the water. The bather should then

dry himself and dress quickly. After cold or sea bathing, a little exercise immediately indulged in, is not only beneficial but essential.

Turkish Bath.—The Turkish bath is intended to produce extreme perspiration with cleansing effect, to remove fatty matter from the skin, with attendant loss of weight. These baths must not be taken under any circumstances by those who suffer from valvular disease of the heart, aneurism, fatty degeneration of the heart, or by very old persons. There is very great danger of taking cold by going out into the cold air too soon after taking a Turkish bath. The establishments where these baths are given are usually provided with abundant means for resting and for allowing a sufficient time—certainly an hour at least—to elapse before exposing one's self to the dangers of cold air. Apart from any medicinal effect, the Turkish bath is a form of cleansing to be most highly recommended. The sweating in the hot room brings the dirt and fatty matter to the surface, and the subsequent thorough scrubbing with flesh brush and soap, and the flooding with water, cleanses the skin and opens the pores.

Hot Bath.—In a hot bath, the temperature of the water varies from 90° to 112° Fahrenheit. It is not taken by persons in good health. Its effects are powerfully stimulating upon the vital processes, and, if sustained for more than ten or fifteen minutes, the hot bath is very weakening. Its chief use is to induce perspiration with a view to alleviating a fevered condition. It is also beneficial in extreme cases of nervousness. The hot bath is generally administered by placing the patient in tepid water, the temperature of which is gradually increased. On the completion of the bath, the patient is warmly wrapped in blankets.

Shower Bath.—The cold shower bath is a greater shock to the system than is the cold all-over or plunge bath. The shock is greatly intensified by a large volume of cold water falling from a considerable height. The effects of this form of bath are very quickly felt, and are more far-reaching than are those of immersion. Such baths are usually arranged so that the temperature of the water may be varied and regulated as desired. When the shower is used as an adjunct of the Turkish bath, and is employed to reduce the temperature of the body gradually, warm water is first turned on and the temperature slowly lowered as the subject can stand it. Under no circumstances should the shower be long continued. Its duration, when the water is cold, is not to be measured by minutes but by seconds.

How to Make a Homemade Shower Bath.—Even in houses otherwise well provided with bathing facilities there is often no provision

made for the shower bath. The preparation of a shower bath is a very inexpensive matter. One must first choose a satisfactory place for it. Any place where provision can be made for catching the falling water is all that is required. A large tub in which the bather can stand while taking his bath will answer very well. Take a small-sized tub, one that

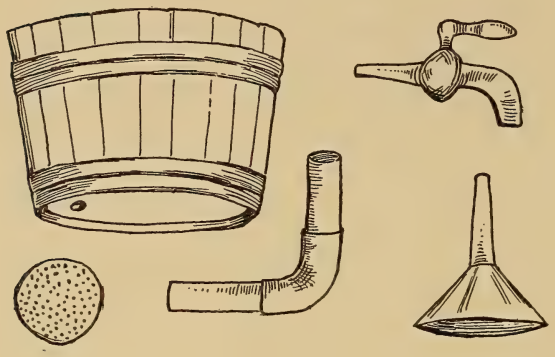

FIG. 3.
DETAILS OF PARTS
FOR HOMEMADE SHOWER BATH.

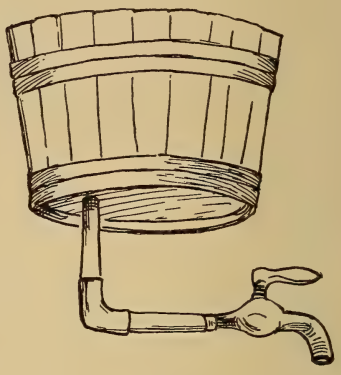

FIG. 4.
PARTS OF SHOWER BATH
PUT TOGETHER.

will hold two or three buckets of water—a large-sized butter or lard tub is of a suitable size—and bore a hole in the bottom, near one side, large enough to contain the end of the pipe. Procure two pieces of iron pipe, one and one-half inches in diameter, and from ten to twelve inches in length, and an elbow to match. Fit the pieces of pipe into the elbow. Plug one end of the pipe with a piece of soft wood. Bore a hole through the plug of wood large enough to admit the end of an ordinary brass faucet. Cut a piece of tin to fit the end of a good-sized funnel. Perforate this piece of tin with a number of holes. Solder the top thus made on the end of the funnel. Solder the small end of the funnel to the faucet. Insert the free end of the pipe into the hole in the bottom of the tub, and your shower bath is completed. The apparatus is to be placed at a convenient height, upon a beam, or a shelf. The ease of filling the tub must be considered in such arrangements as are adopted.

Bath Thermometer.—The hand is a poor and unreliable test for the temperature of water for bathing, except in cases where there has been education and experience from long practice. For the hand is one of the most exposed parts of the body, and is not so sensitive to heat and cold as are those parts which are warmly clad. A most useful acces-

sory to the bath of both children and adults, therefore, is a bath thermometer. This is an ordinary thermometer encased in wood on three sides so that it floats easily in the bath and is protected from breaking against

Fig. 5. Bath Thermometer.

the metal sides of the tub. It is placed in the water and allowed to float for five minutes, when it is read in the ordinary way. The temperature of the water for the several sorts of bath is as follows:—

Hot Bath,	Over 98° Fahrenheit.
Warm Bath,	Between 90° and 98° Fahrenheit.
Tepid Bath,	Between 80° and 90° Fahrenheit.
Cool Bath,	Between 65° and 80° Fahrenheit.
Cold Bath,	Below 65° Fahrenheit.

Russian Baths.—Russian baths are mainly vapor baths. The subject is placed in a small room completely filled with hot steam, where he remains until a copious perspiration is induced. The body is then thoroughly scrubbed and the temperature gradually lowered, the bath ending with a cold bath or shower.

Sponge Bath.—Owing to a lack of conveniences, this is the only form of daily bath that can be taken by many persons. The requisites are a large basin full of good, soft water, a mild soap, a piece of face cloth or a sponge, one soft towel and one rough one. Use cold water in summer and tepid water in winter. The entire body is to be quickly rubbed over with the soaped sponge or face cloth. If the temperature of the room is low, a part of the body is to be washed and dried at a time, the rest being protected from the cold by clothing. After washing, the skin is first wiped dry with the soft towel, and then the rough towel is used briskly for four or five minutes, until the flesh is all aglow. The chest and the abdomen require the most attention in the rubbing, but the tenderness of the skin will determine the rigor of this treatment.

Bath Room Accessories.—The water used in bathing is to be preferably soft water. Hard water does not mix well with soap, is a poor cleanser, and is injurious to the skin. Usually, however, no choice can be exercised in this matter, as the bather is entirely dependent upon the water supply; but the addition of a little powdered borax will render

hard water less disagreeable; and a very little pearline will greatly increase the cleansing power of all water.

Soap.—No very cheap soap can be good soap. That which is to be used on the face especially should be of the best quality obtainable. The chief quality that all soap should possess is that it contains no free alkali. In the manufacture of soap an alkali is mixed with oil or grease. If more alkali than is needed is used to mix with the oil or grease, some of it will be free, and in that form it has a caustic, burning effect upon the skin. Good, pure soap is one of the little luxuries of life that all should try to afford. A simple test of free alkali in soap is to hold the soap for a moment to the tip of the tongue; if free alkali is present a burning sensation will quickly be felt in the tongue. Highly scented soaps, especially those of a cheap grade, should be looked upon with suspicion, as the heavy, cheap perfumes used in their manufacture admit of the use of an inferior and objectionable grade of oil or grease.

Face Cloths.—Face cloths are preferable to sponges, as they are much more easily cleansed and dried after use. The chief use of the face cloth or sponge in bathing is to insure a complete removal of the soap from the skin after bathing.

Flesh Brush.—This is indispensable to a good cleansing bath. Friction is needed to remove obstructions of fatty matter and secretions which choke up the pores of the skin, and which, if permitted to remain, produce pimples and blackheads. No properly performed bath is possible without this aid.

Face Brush.—A softer form of flesh brush, made of camel's-hair, is of great service in bathing the face. A vigorous rubbing of the face with this, and the use of hot water and good soap, will do vastly more than cosmetics to produce a fine complexion. The regular use of the face brush produces a satin-like bloom that no art can supply.

The Complexion.—The great cause of a lack of beauty lies not so much in irregular contour of the features, or in lack of expression, as in the bad condition of the skin. This, so far as the face is concerned, is called the complexion. Too often, neglect to care properly for the skin of the body brings eruptions and blemishes upon the face. Of course a woman is abundantly justified in temporarily concealing the eruption or blemish by all the means in her power; but she is not justified in neglecting to instantly and intelligently attack and remove the cause of such blemishes. That cause is most likely to be found in some irregularity of diet, especially in the consumption of large quantities of pastry.

Abstinence from this, in its several seductive forms, and attention to the condition of the blood, will work wonders in this direction. A good fruit diet, green vegetables, and hot water, to take the place of sweets, tea, coffee, fats, and the like, is a sure cure. Saline purgatives, Rochelle salts, cream of tartar, sulphur soap and ointments, tar ointment, persistently used for a time, will abundantly repay all trouble and self-denial.

Cream for Pimples.

Lanolin,.....8 ounces.
Sweet Almond Oil,.....8 ounces.
Precipitated Sulphur,.....8 ounces.
Oxide of Zinc,.....4 ounces.
Extract of Violet,.....15 drops.

A very little of this ointment carefully applied to the pimples at evening will be found very effective. Refrain from the use of the face brush and other irritations until cured.

Summer Rash.—There is an annoying form of pimple accompanied by a redness or rash, which usually comes upon the face and neck in summer. It is prevented by attention to the diet, as it is caused by irregularities in eating. Starchy foods, much meat, and heating foods of all sorts are to be avoided.

Freckles.—There are two sorts of freckles,—temporary and permanent. Temporary freckles appear after exposure to winds and strong sunlight; they usually disappear with shade and protection. Bathing the face frequently with soft water and pure soap, with liberal and energetic use of the face brush, will so stimulate the circulation of the blood that these freckles will soon disappear. Their removal may be hastened by the application of the cream and lotion given below. The cream is to be applied at night on retiring and the lotion several times during the day:—

Cream for Freckles.

Ointment of Elder Flower,.....1 ounce.
Sulphate of Zinc,.....20 grains.

Lotion for Freckles.

Infusion of Roses,.....8 ounces.
Citric Acid,.....30 grains.

This lotion is to be kept in a close stoppered bottle. If it irritates the skin, relief will be afforded by the use of the following:—

Healing Lotion.

Boracic Acid,.....1 dram.
Witch Hazel Extract,.....2 ounces.
Rose Water,.....2 ounces.

Permanent Freckles.—The permanent freckle usually appears in winter and the cool weather. It can be removed only by the removal of the outer skin. This can be done without pain, although the applications will cause redness of the skin and some irritation while they are being used. When this occurs, the condition will be at once relieved by the use of the healing lotion given.

Wash for Permanent Freckles.

Lactic Acid,.....4 ounces.
Glycerine,.....2 ounces.
Rose Water,.....1 ounce.

This is to be applied carefully to each freckle so as not to involve the surrounding clear skin. The irritation which this will most likely cause may be allayed by using the following:—

Ointment.

Oil of Almonds,.....4 ounces.
Vaseline,.....3 ounces.
Spermaceti,.....1 ounce.

Melt and add

Tincture of Benzoin,.....15 drops.

Chapping.—Chapping of the skin of the face is prevented by the use of a veil as a protection against cold winds. The following cream is delightfully soothing for chapped face and hands:—

Cream for Chapped Face and Hands.

Spermaceti,.....¼ ounce.
White Wax,.....¼ ounce.
Almond Oil,.....¼ pound.
Cocoa Butter,.....¼ pound.
Lanolin,.....2 ounces.

Melt and add

Balsam of Peru,.....1 dram.

Let it settle. Pour off the clear liquid and add

Orange Flower Water,.....2 drams.

Stir until it solidifies.

Apply two or three times a day with a piece of soft cotton cloth or

flannel. The face may be bathed in tepid water, with a little soap, an hour after each application.

Tan and Sunburn.—Tan and sunburn may be removed by this lotion:—

Lotion for Tan and Sunburn.

Borax, ...10 grains.
Limewater, ...2 ounces.
Oil of Sweet Almonds, ...2 ounces.

If the skin is inclined to "peel" from the effects of the sunburn, after using this wash twice a day, the following wash, used every morning after washing, will relieve the condition:—

Lotion for Peeling Skin.

Sal Ammoniac, ...2 drams.
Alcohol, ...2 ounces.
Rose Water, ...1 pint.
Venetian Talc, ...1 ounce.

Yellow or Liver Spots.—Large yellow spots that form on the skin are produced by inactivity or irregularities of the liver. Small doses of calomel and the application of either of these lotions will soon cause them to disappear:—

Wash for Liver Spots.

Kaolin, ...1 ounce.
Lanolin, ...1½ ounces.
Glycerine, ...1 ounce.
Carbonate of Magnesia, ...½ ounce.
Oxide of Zinc, ...½ ounce.

Apply at night on retiring and allow it to remain all night.

Wash for Liver Spots.

Oleate of Copper, ...15 grains.
Oxide of Zinc Ointment, ...½ ounce.

Apply every night and morning.

Blackheads.—Blackheads are formed in the obstructed pores of the skin, and consist of fatty matter surmounted by black accumulations of dirt. They are best removed by treating the skin for two or three weeks with the following cream, to soften the skin:—

Cream for Softening the Skin.

Lanolin, ...1 ounce.
Almond Oil, ...1 ounce
Tincture of Benzoin, ...½ ounce.

Mix and rub well into the skin night and morning. This application is intended to so soften the skin that the blackheads may be squeezed out without danger of rupturing the delicate tissues or of leaving small scars. Wash the face well with good soap and hot water before applying the cream. If after two or three weeks' treatment, the skin is not sufficiently softened to permit of squeezing the blackheads out by gentle pressure, recourse must then be had to green soap. The face is first to be bathed in water as hot as can be borne. Cloths wrung out of hot water are then to be applied and frequently renewed. This is to be continued for fifteen minutes. The green soap is then applied by rubbing it well into the pores of the skin. It is a soft, jelly-like substance, procurable at all drug stores. The soap is then well rinsed from the face by several waters and with a free use of the face brush. This not only removes the soap from the pores but brings many of the blackheads away at the same time. The cream mentioned above is then applied to the skin, and the operation is repeated each night until all the blackheads have disappeared.

Wrinkles.—A wrinkle is usually caused by the falling away of the adipose or fatty tissue between the skin and the muscles through weakness, disease or age. Age has been spoken of as that period of life when the waste of tissues is greater than the repair. Consequently wrinkles are to be expected after sixty. Prior to that they may be regarded as premature. Then we must look for other causes which are capable of being removed. Those wrinkles that are an indication of character and temperament, if characteristic of undesirable qualities, can be removed only by the exercise of the opposite benevolent trait, which simply means a decided change in character and disposition. Those that are characteristic or indicative of good qualities are by no means to be considered as blemishes. A countenance devoid of lines is expressionless and unattractive.

Besides the wrinkles which are to be considered as the character lines of the face, there are lines and wrinkles formed by little habits and tricks of manner, which can be removed permanently only by stopping the objectionable practices. Then there are those wrinkles which come from illness, anxiety, care, and fretfulness.

The great principle underlying the removal of wrinkles is the improvement of the general health and observance of the laws of hygiene. By such means the layer of adipose tissue which gives roundness and fullness to the face and body, and which has disappeared, is to be restored with

a view to filling out the hollows and vacancies between overlying muscles. Supplement these means with careful and skillful massage, the application of a good skin food, physical culture, and the cultivation of a happy disposition, and, probably, all of the available and requisite means are enumerated.

Skin Food for Wrinkles.

White Wax,.....1 ounce.
Spermaceti,.....1 ounce.
Lanolin,.....2 ounces.
Sweet Almond Oil,.....4 ounces.
Cocoanut Oil,.....2 ounces.
Tincture of Benzoin,.....3 drops.
Orange Flower Water,.....2 ounces.

Melt together the solids and the oils; beat until nearly cold; mix the benzoin and the orange flower water and add it a little at a time while beating.

This is a valuable tissue builder to be used with massage when the skin is dry and wrinkled. There are many mechanical appliances for administering massage but none of them is comparable to the manual method.

Warts.—These are to be removed by tying a string around them when they are pendulous, or hanging by a stalk; the string is to be worn until the wart falls off by reason of the stoppage of the supply of nourishment upon which it feeds; or, when flat, the wart may be treated with nitrate of silver or lunar caustic. This comes in the form of a white pencil. The end of it is dipped in water and rubbed over the surface of the wart. On exposure to light the nitrate of silver turns jet black. Care must therefore be taken that the treatment is confined to the wart, and that the surrounding tissues are not touched. As the caustic burns the wart away, the surface of the wart is to be pared with a sharp knife and the treatment applied anew to the fresh surface. Care must be taken that the paring does not cause the wart to bleed. Other strong escharotics, such as strong or glacial acetic acid, nitric acid, caustic potash, tincture of iron, and hydrochloric acid, may be used by those who know something about their properties. But, as they are extremely dangerous in their effects if wrongly used, the caustic treatment is to be preferred.

CLOTHING.

As it is a part of the office of the clothing worn next to the skin to take up the perspiration and exhalations of the body, it follows that

frequent change of this is not only advisable on the score of comfort, but is absolutely necessary to health. The exhalations from the bodies of some persons are quite profuse and offensive in odor. Especially is this true of the emanations from the feet even in spite of all attempts at cleanliness. Frequent changing of the garments, then, becomes imperative. If the feet perspire copiously this may be checked by bathing the feet daily in water in which a small piece of alum has been dissolved. This has the effect of closing the pores by the astringent or puckering power of alum. The offensive odor may be gotten rid of by shaking talcum powder into the socks or stockings and shoes each day. The shoes should be dried out frequently, as the perspiration accumulates in them sometimes to an offensive degree.

The underclothing in winter should be of wool; and even in summer, wool or a mixture of wool and cotton known as merino, should be worn. Some skins are so tender that they will not bear wool next to it. Silk is ideally comfortable in summer, but, unfortunately, is debarred by its expensiveness. Woolen clothing worn next to the skin is almost a sure guarantee against chills after overheating or in cold weather. The danger of a chill is one of the greatest risks to which we are exposed, as it nearly always means at least a cold, and sometimes pneumonia or inflammation. Cotton garments when damp from perspiration become cold and uncomfortable; but, as was rather paradoxically said of a woolen undergarment, "It is always dry and warm no matter how cold and wet it is." The chief objection to woolen garments is that, even though great care be taken in washing them to prevent shrinking, they, in time, become stiff and hard, losing the absorbent properties which make them so comfortable and healthful.

In cold weather woolen clothing is warm by reason of the pores or cavities in the fabric in which the air lodges; and air is one of the best non-conductors of heat. For, in addition to the necessity of keeping the cold out, much of one's comfort in winter depends upon keeping the warmth of the body in. A tightly fitting coat buttoned up is warmer than a loose fitting garment, as the former keeps a layer of non-conducting air next to the body. For the same reason two thin woolen garments are warmer than one thick one.

In summer, light-colored clothing of cotton or linen is much cooler than dark-colored or woolen clothing.

The great danger of taking cold lies in sudden changes of temperature where the climate is so variable that one does not know quite how to dress

for the day. But in such cases it is rather better to err by providing clothing which is uncomfortably warm than to risk exposure in clothing that is too thin.

Many attempts have been made from time to time to introduce sanitary and hygienic clothing, but these efforts have been attended with but slight success. Not that the suggestions were not practical or meritorious from a sanitary and hygienic standpoint, but that the shapes and styles proposed were so much at variance with the prevailing fashions that no one had the desire or temerity to adopt them.

It is generally true that women are not nearly so warmly clad as are men. This is, perhaps, because of the fact that they are not exposed to the rigors of climate and to the inclemency of the weather so much nor for so long a time as men are; and also for the reason that it is a physiological fact that they have a much thicker deposit of subcutaneous fat than men have. At all events the dictates of fashion and the social demands appear to make them run very great risks on occasion. Certainly the thin-soled slippers, thin stockings, low-necked and short-sleeved gowns in which they are so often seen in bad weather justify the fears that they do expose themselves injudiciously in compliance with the conventionalities of life and the customs of society.

For protection against rain, the best material is one that will keep out the wet, and, at the same time, allow the perspiration and exhalations from the skin to pass off. The clothing must not be of such a nature as to permit rapid drying by evaporation while on the body; for evaporation absorbs heat and causes a chill, which must always be avoided. So far as the perspiration is concerned, there should be rapid absorption and slow evaporation; and, regarding the rain, slow absorption and slow evaporation. Wool meets these requirements better than any other fabric. The wool is porous and therefore absorbs a great deal of water; being thick the water does not evaporate too quickly. In addition, the wool is warm. When woolen garments are treated with the well known waterproofing process, their efficiency as a protection against rain is increased. Waterproof materials of the rubber variety are objectionable because they are not porous and do not allow the perspiration either to be absorbed or to pass off.

It is essential that the feet be kept dry. Snow water is more penetrating than rain water. Under no conditions should one sit with either damp or cold feet. Dry, warm woolen socks or stockings should be put on at once. In the case of women, very often the edges of the skirts

become wet from rain or snow. The skirt should be changed, if possible, but certainly should be dried at once.

No one should sit for any length of time with rubber overshoes on. These exert an uncomfortable drawing effect upon the feet, and are weakening. By reason of their being air tight, they interfere with the necessary ventilation of the feet. Bad effects are produced when children are permitted to wear rubber overshoes during school sessions.

Tight Neckwear.—A great deal of eye trouble and headache is directly traceable to the wearing of tight collars and other neckwear. These have the effect of constricting the throat and of interfering with the circulation of the blood. The neck is provided with large and important blood vessels which supply the brain and some organs of special sense. If this fresh supply is prevented from reaching the brain, or if the return of the impure blood from the brain is impeded, as is often the case when bending or stooping over a tight collar, the effects are necessarily injurious. The effect is quite the same as when a string or rubber band is tightly tied around the finger. The constriction of the blood and its retention and congestion in the head produce many eye troubles and headaches.

Changing Underclothing.—It is the habit of many people to change the underclothing for a lighter or heavier weight at the change of seasons. There are some, however, who wear the same weight all the year around, and who regulate their health and comfort by the weight and number of the outer garments. Where the change is made, especially from a heavy to a lighter weight, it must be done with care and judgment. It is best to make the change in the morning on rising, and to select a fine, mild day for the purpose. These conditions are most favorable and least dangerous.

Hardening Children.—The habit of dressing children rather lightly for the purpose of hardening them and of inuring them to cold, very often falls little short of cruelty and inhumanity. If immediate bad results from this practice are not noticeable, parents are often inclined to think well of it and do not take into consideration that they are planting the seed of future disease and are undermining the child's health. It is most reasonable that the use of short stockings and the exposure of several inches of bare legs to cold winds in chill weather must be not only uncomfortable but decidedly dangerous. It is a safe rule in the dressing of children for protection against cold to clothe them as far as possible in woolen garments throughout.

Too Much Clothing.—On the other hand, there is a possibility of overclothing one's self. The proper protection in a variable climate requires care, judgment, and observation. The greatest safety lies in uniformity under like conditions. Wrapping and bundling up the throat and neck is dangerous, not so much from doing it, as from the neglect to do it on a cold day after the organs have become accustomed to the protection. One's own comfort is a safe guide to follow in the matter of clothing.

Exercise and Food.—It is by exercise and proper food that the body is invigorated and not by insufficient clothing and exposure. Nor should weight of clothing be mistaken for warmth. Laboring under this mistaken notion, feeble persons are often seen exhausted and weakened by an incredible weight of clothing. Especially is this mistake prevalent in the matter of bed clothing. One is more likely to be deceived in this connection by cotton clothing and fabrics than by woolen goods.

Tight Waist Clothing.—Much has been written and spoken against wearing tight garments and supports around the waist. A general tirade and an energetic crusade have been conducted with little effect against the corset. Corsets have always been worn by civilized races, probably always will be worn; fashion dictates their use, and women require the support which they give. But all of this does not lessen or justify the injury of excessively tight lacing by women, or the tight belt which the summer or negligee dress of men has so much encouraged. In these cases the constriction of the waist and abdomen displaces the organs and prevents deep abdominal breathing. The breathing of women differs essentially from that of men. Woman's breathing is largely chest breathing. Few of them know the pleasure and value of deep, hearty breaths, and on this account the regular practice of breathing and chest expansion exercises, night and morning, are strongly recommended.

CARE OF THE HAIR.

The hair is designed as a protection against heat, cold, and injury from blows. It is a modified or changed form of the cuticle or skin. It is found on all parts of the body except the palms of the hands and the soles of the feet. The luxuriance of growth varies greatly in different persons and is largely influenced by heredity, temperament, and constitution. Each hair is tubular in shape, and is composed of hard, colorless scales, which overlap one another like shingles on a roof. The interior of the hair is hollow or porous. Buried well down in the true

skin is a bulb, the papilla, where the growth of the hair proceeds at the rate of from five to seven inches a year by the constant formation of numerous cells. When a hair is pulled out, this bulb is seldom injured, but produces a new hair. If the papilla is in any way injured or destroyed, the hair can never grow again. The lower part of the bulb is supplied with small nerve and blood-vessel connections for both sensation and nourishment. The space around the bulb is the true seat of growth and of life, and is known as the follicle. A little above these parts is a small muscle interlaced among the fibers of the skin. These small muscles contract with cold and under other influences. This contraction puckers the skin and causes the hair "to stand on end." Above this are the two oil or sebaceous glands which secrete an oil to keep the hair soft.

Baldness is due to the death of the follicle, and the peculiar shiny appearance of the scalp is a sign that this stage has been reached. No effort will then produce a new growth of hair. When baldness begins there is necessity of arresting the process and of taking good care of the hair that is left.

Color of the Hair.—The color of the hair is due to the presence of a mineral ingredient in the pigment, or coloring matter, in the cells. It is said that the various colors of the human hair have all been caused by the mixture of three primary colors: red, yellow, and black. Yellow hair has the yellow coloring matter alone; browns, reds, and dark hair are composed of varying mixtures of all three; and the blackest of all hair has some red coloring matter mixed with the black. Chemical analysis shows that yellow or very light hair is colored by salts of magnesia; the browns and dark hair owe their color to the presence of sulphur; and black hair is so colored by iron. These mineral coloring matters are affected by both age and health in this order: iron, sulphur, magnesia. Accordingly it is observed that black hair usually turns gray first, and blond hair retains its original color much later in life than the other shades.

Cleanliness.—There is a prevalent prejudice against washing the hair on the ground that washing removes the oil from the hair and tends to make the hair dry, brittle, and liable to split. If the washing is done in such a way as to bring about these results, it certainly is injurious. But it is the method that must be changed rather than the practice stopped. Absolute cleanliness of the scalp is necessary to the healthy growth of the hair. The scalp is a part of the skin. It has its exudations of per-

spiration and of fatty matter just as the rest of the body has. The accumulation of this matter and the clogging of the pores is quite as injurious in the scalp as in any other part of the body, and the removal of the matter is just as necessary. There is also an accumulation of accidental dirt on the scalp and the adherence of particles of dust and dirt to the hair which must be removed.

It is not by the practice of washing the hair once a week that the injury is done, but by the use of much soap and ammonia and other harmful ingredients of shampoos that this condition of the hair is often brought about. Some consider that the use of the brush and comb is sufficient to keep the hair clean. The object of the comb is to straighten the hair and to prevent matting and tangling. It also produces some slight electrical stimulation at times. The comb should not be used to violently scratch the scalp, as this sets up inflammation and causes a heavy growth of dandruff as well as an annoying irritation. The brush is intended to evenly distribute the natural oil of the hair throughout its length, and, while the brush should be fairly stiff to perform this work, it should not have wire bristles, as these are more harmful than the harshest possible use of the comb. The natural oil of the hair is quite as well able to withstand the application of water as are the feathers on the back of ducks and other aquatic birds. Water without soap will not affect the oil of the hair, for oil and water do not mix. If a lather is desirable in washing the hair, it can be produced most abundantly by using the white or the yolk of an egg. After the hair has been thoroughly wet with the water the egg is applied and well rubbed in. The lather which results has great cleansing power on both the scalp and the hair without disturbing the oil of the hair. When the lather is well washed out, the hair and scalp are both in splendid condition. The albumen of the egg has also some effect in soothing any irritation which may exist, for it is a good emollient application to inflamed surfaces.

Dandruff.—This is a natural formation on the scalp and is not a disease. But if the deposit is excessive so that it cannot be removed by ordinary cleansing methods this indicates an unhealthy condition of the scalp. In obstinate cases either of the following applications will be found helpful and efficient:—

For Dandruff.

Yolk of one egg.
Hot Rain Water,.....1 pint.
Spirit of Rosemary,.....1 ounce.

Beat the mixture together thoroughly, and, while warm, rub it well into the scalp. Rinse well in several waters.

To Prevent Dandruff.

Oil of Rosemary,.....1 dram.
Liquor Ammonia,.....2 drams.
Glycerine,.....1 ounce.
Oil of Thyme,.....1 dram.
Tincture of Cantharides,.....2 ounces.

Mix with 12 ounces of rose water. Apply this well to the scalp, rubbing it in vigorously. Continue its use until the dandruff disappears.

Dandruff Lotion.

Tincture of Cantharides,.....½ dram.
Solution of Carbonate of Potassium,.....1½ drams.
Extract of Rosemary,.....1 dram.
Distilled Water,.....4 ounces.

This is to be applied and well rubbed into the scalp after the hair has been thoroughly washed.

Ventilation.—The hair like other parts of the body requires to be well ventilated. Fresh air must have access to the scalp, and the emanations from the pores of the scalp must be permitted to escape. This is true of all parts of the body, but the penalty exacted for its violation in regard to the scalp is greater by the weakening of the hair and its ultimate loss if persisted in. Consequently heavy headgear, wearing the hat in the house and office, and the tight coiling of the hair by women are injurious to the hair. The removal of the hat on occasions, to which good manners obligates men, is, therefore, beneficial to them. It is claimed by many scientists that ill ventilation of the scalp is one of the most fruitful causes of baldness. The necessity of keeping the head cool at all times has passed into a proverb; but experience shows that too often a proverb slips glibly from the tongue without making much impression on the mind.

Friction and Massage.—The point at which friction of the scalp, or scalp massage, is directed is the circulation of the blood in the scalp. The indications of imperfect circulation are: dryness of the hair, brittleness and consequent breaking and splitting of the hair, excessive oiliness, and persistent dampness at the roots of the hair from perspiration. When it is remembered that the circulation of the blood through the scalp is the

FIG. 6. MASSAGE OF THE HAIR. FIRST MOVEMENT.

means by which the tissues are fed and nourished, it will be easily seen that, if the circulation is imperfect, the whole tissue and all of its dependents will suffer; and that if the circulation is restored to its normal condition, growth will be stimulated and decline and decay will be arrested. Scalp massage, if properly performed, will do that very thing.

The stimulation of the blood vessels in the scalp by massage is comparatively easy, since there is a strongly resisting surface of bone throughout against which gentle pressure is exerted. It is not nearly so hard as to treat by massage those deep-seated vessels which are surrounded by soft yielding tissues in other parts of the body.

FIG. 7. MASSAGE OF THE HAIR. SECOND MOVEMENT.

FIG. 8. MASSAGE OF THE HAIR. THIRD MOVEMENT.

In administering scalp massage, the hair, if long, should be loosened and parted in the middle. The fingers are placed close together, with the tips upon the scalp, and gently forced into and upon the scalp from the crown towards the forehead. The entire surface of the scalp is gone over in this manner.

Next the tips of the slightly separated fingers of both hands are pressed into the scalp with a rotating motion. This treatment is applied to the entire surface of the scalp.

The fingers are then separated, and

the head is struck gently with a sidewise action of the hand, the little finger of both hands striking the scalp first. At the moment of striking, the other fingers loosely held, strike against the little fingers only. This has the effect of a series of blows, gentle at first, but cumulative in their effects when rapidly performed. This treatment is given to the entire scalp.

Itching.—The itching of the scalp, which usually accompanies the excessive formation of dandruff, is extremely annoying and uncomfortable. There is strong probability that it is occasioned by a parasite. If this be the cause, it will quickly respond to a few washings with bichloride of mercury soap, or, as it is often called, sublimate soap. This is a good agent for killing parasites and also for relieving itching of the skin in other parts of the body from other causes.

Falling Hair.—This is to be regarded as a sign of general debility and of failing health, but only when it is persistent. It does not apply to the occasional falling of the old hair which is displaced at times by a new growth. There need be no alarm over the matter unless the fall of hair continues. It frequently follows fevers and other weakening diseases. It must be, first of all, attacked by building up the system with a good course of tonic medicines taken internally. Sometimes the cutting of the hair is necessary, and, in the case of men, this should be done frequently. Cleanliness is to be faithfully observed, and one of the following lotions may be applied with advantage:—

For Falling Hair.

Eau de Cologne,.....2 ounces.
Tincture of Cantharides,.....2 drams.
Oil of Lavender,.....10 drops.
Oil of Rosemary,.....10 drops.

Mix thoroughly and rub a little into the scalp night and morning.

For Falling Hair.

Beef Marrow,.....6 ounces.
Nervine Balsam,.....2 ounces.
Peruvian Balsam,.....2 ounces.
Oil of Almonds,.....1½ ounces.
Extract of Cantharides,.....16 grains.

Melt the marrow and the nervine balsam in the oil; strain and add the Peruvian balsam, and, lastly, the extract of cantharides dissolved in one dram of rectified spirits.

Rub the pomade into the scalp night and morning for a week. Too frequent, or too liberal, application will cause soreness. In that event use less and apply only once a day.

For Falling Hair.

Fresh Lemon Juice,.....1 dram.
Extract of Peruvian Bark,.....2 drams.
Beef Marrow,.....2 ounces.
Tincture of Cantharides,.....1 dram.
Oil of Lemon,.....20 drops.
Oil of Bergamot,.....10 drops.

Mix by melting and stirring. Wash the head and dry thoroughly at night. Next morning apply a little of the pomade and rub well in. Continue the application for four or five weeks.

For Falling Hair.

Burnt Alum,.....1½ drams.
Biborate of Soda,.....1½ drams.
Beef Marrow,.....1 ounce.
Essence of Bergamot,.....6 drops.

Mix by melting and stirring. Rub well into the scalp night and morning.

For Falling Hair.

Oil of Mace,.....1½ ounces.
Olive Oil,.....2 drams.
Aqua Ammonia,.....1½ drams.
Spirits of Rosemary,.....1 ounce.
Rose Water,.....2½ ounces.

Mix and rub well into the scalp night and morning.

For Falling Hair.

Bay Leaves,.....2 ounces.
Whole Cloves,.....¼ ounce.
Spirit of Lavender,.....4 ounces.
Spirit of Thyme,.....4 ounces.

Mix and allow to stand for six days, shaking the mixture well once a day. Filter, or strain through very fine cloth. Add half an ounce of ether. Apply a little night and morning, rubbing well into the scalp.

For Falling Hair.

Hydrochlorate of Jaborandi,.....6 grains.
Tincture of Jaborandi,.....4 drams.
Spirit of Rosemary,.....2 drams.
Vaseline,.....4 ounces.
Alcohol,.....4 ounces.

Apply every night. Rub well into the scalp.

For Falling Hair.

Eau de Cologne,.....8 ounces.
Tincture of Cantharides,.....1 ounce.
Oil of Lavender,.....½ dram.
Oil of Rosemary,.....½ dram.

Mix. Shake well. Rub into the scalp twice a day.

For Falling Hair.

Castor Oil,.....1 ounce.
Bay Rum,.....1 ounce.
Tincture of Cantharides,.....1 dram.

Mix. Shake well. Rub into the scalp night and morning.

Gray Hair.—Heredity has much to do with prematurely gray hair. Although, after the tricks of heredity, the inheritance may skip a generation, and the fact that one's father or mother was not gray is no proof that heredity has nothing to do with this special case. One must look farther back before deciding. Well authenticated cases are on record of the sudden changing of the hair under the influence of fright, grief, illness, and anxiety. Sometimes the change is gradual and the beginning of it may date from one of these influences. Some people object to the intervening stages of yellowish gray color through which the hair generally passes and seek to change the color to white at once. There is no way known by which this can be done without injury to the hair. Gray hair may be slightly darkened by the use of one of the following applications, but they are in no sense of the word hair dyes:—

For Darkening the Hair.

Glycerine,.....1 ounce.
Rose Water,.....1 ounce.

Mix and rub well into the roots of the hair each morning. This is not at all injurious, and is sometimes used for darkening hair which has not turned gray.

For Darkening the Hair.

Green Tea,.....1 ounce.
Freshly Dried Sage,.....1 ounce.
Rain Water,.....1 pint.

These are to be boiled in an iron vessel and allowed to stand in it for 24 hours. Rub well into the roots of the hair night and morning.

Homemade hair dyes are rarely a success. The changes of the complexion and of the skin keep pace with the changes of the hair. When the latter is dyed, ever so successfully, there is at once such a subtle, perceptible lack of harmony between the complexion and the dyed hair that no one is deceived by the practice. Gray hair, when well kept, is becoming, and is regarded with more and more esteem every year. When a dye is not well applied, the hair streaks, and if the hair is not regularly treated, the gray roots of the hair are sure to be most conspicuous. The dyes which contain lead are positively injurious and should never be used.

Bleaching the Hair.—The woman who yields to the desire for golden hair when Nature decreed another color, assumes a terrible burden of discomfort and anxiety. The difficulties of the bleach by the peroxide of hydrogen are a tremendous price to pay for an adornment that seldom deceives any one but the wearer. The roots of the hair, being rich in natural coloring matter, are always darker for an inch or two next to the head than the rest of the hair; and the tips of the hair are always much lighter, to say nothing of the variegated streaks of natural color which will persist in showing, even after a whole day has been spent on the operation of bleaching. Hair that has been bleached may be returned to its original color only by the use of a dye until it changes; or one may heroically stop the use of the bleach and let the color return openly. The tips of the hair, however, will never resume the original color. They will always remain tow white, and must either be dyed or sacrificed by cutting. Apart from this, peroxide used alone, if chemically pure, will not injure either the constitution or texture of the hair. The great harm is done by the admixture of ammonia, which hairdressers sometimes use to hasten the process.

Superfluous Hair.—Probably nothing entails so much mortification and suffering upon a sensitive woman as a growth of hair on the face and arms. As far as the face is concerned, there is only one certain method for the permanent removal of such a growth, and that is by the electric needle. Yet this method is slow, painful, and expensive. It is necessary that the needle be inserted into the root of the hair with accuracy and pre-

cision in order to kill the hair at the root. Even by the most expert operators this is done only about ten times in a hundred. If he is not skilled, the face is likely to be further disfigured by scars and eruptions. If persevered in, with this ratio of failure of the hairs treated at a sitting, it will, after much suffering and great expense, prove successful. Those who cannot afford this method or who dare not face it, then turn to chemical hair removers known as depilatories. Many are on the market, and the most absurd claims are made as to their efficacy. But let it be said that there is not yet a single preparation discovered which will permanently remove the hair. Most of these preparations remove the growth temporarily; it returns more luxuriantly and abundant than ever. Hair on the arms may be removed by the use of pumice stone. This wears the hair down to the surface of the skin so that it cannot be seen. Some resort to the heroic means of pulling the hairs out by the aid of tweezers. It is needless to say that in all of these cases the hair comes in again stronger than ever.

CARE OF THE NAILS.

Like the hair, the nails are regarded as modifications of the skin. Their uses are to protect the tips of the fingers, where the sense of touch is extremely delicate, and the toes; also to enable us to pick up small objects easily. The nail is inserted in a groove of the skin, known as the matrix, and is attached to the flesh by what is popularly known as the quick. The growth takes place from a multitude of cells at the root of the nail. The growth of the nail has been measured by making a mark at the base of the nail and then observing the length of time elapsing before the mark has moved or grown up to the tip or end. It has been found that the thumb nail grows from its root to the free end in five months; the great toe nail in ten months.

There are several marks which can be observed on the nails. Ridges running up and down the nail are caused by scraping the surface of the nail either with a knife or file. This practice causes an uneven growth or roughness on the surface in which dust accumulates and destroys the polish. The treatment for this condition is to stop the practice, and to polish the nails with the nailbrush. The same effect is also produced by the habit of scraping the inner surface of the tip of the nail with a knife or sharp steel tool when cleaning the nails. White spots or flecks on the nails are due to an interruption in the circulation of the blood

under the nail, and often result from blows, scraping, or slight cuts of the nail surface. Heavy blows on the nails cause black and blue discoloration by escaping blood from the ruptured blood vessels. The loss of the nail nearly always follows this condition. The moon-shaped, light-colored parts at the base of the nails are caused by a difference of the circulation of the blood at that part. These are regarded as elements of beauty in the nails and are to be preserved. Ridges sometimes run across the nails. These are caused by severe illness or periods of great weakness, during which time the growth of the nail is not so active as before and after the attack. One can tell, often, by these ridges that a person has had a severe illness, and by estimating the location of the ridges on the nail can form some idea of the date of it. This is one of the mysterious observings of palmistry.

Hygiene of the nails requires that the tips or free ends of the nails be kept scrupulously clean. The accumulation of dirt under the nails, besides being uncleanly, is often of a poisonous nature; it is the direct cause of serious consequences when children pick a sore. This accumulation of material under the nails is also a common means of communicating disease. It is most conveniently removed just after washing the hands, and by using the nailbrush over the extremities of the fingers. The nail is nearly surrounded, except at the free extremities, by a protective sheath, which should not be allowed to adhere to the nail, as it grows with, or is drawn along by, the growing nail. After a time it breaks or splits, forming the painful agnail, commonly called hangnail. This can be prevented by pushing the sheath back from the nail gently while the hands are still moist from washing. A sharp edge should never be used for this purpose; the towel is much better. If these sheaths become ragged from neglect of this simple means, they may be snipped off with scissors to prevent more serious tearing. It is, perhaps, unnecessary to say that good breeding and a proper regard for the comfort of others require that all of this attention to the nails is to be performed in private with the rest of one's toilet.

Manicuring.—The proper and systematic care of the nail is known as manicuring. It is an act which any and all can perform, as it is extremely simple. Professional manicurists surround themselves with almost as many tools as a dentist. But these are not at all necessary. A satisfactory and complete outfit is extremely simple and inexpensive.

1. Nippers for cutting the nails are much more convenient and effective for personal use than are either curved or straight scissors, or

a knife. In fact a knife should never be used for treating the nails; for, while there are a very few little attentions which it can give well to the nails, there is such great temptation to make improper and injurious use of it.

Fig. 9. Nail Nippers.

2. A file for smoothing and shaping the edges of the nails after cutting with the nippers. It should be of the finely cut variety known as the velvet file.

3. A bundle of orange wood sticks for cleaning the extremities and for pushing back the sheath from the base and sides of the nails.

4. A piece of chamois leather or a buffer for polishing the nails.

5. A box of rose-colored nail paste.

6. A box of nail powder.

7. A piece of pumice to remove spots or roughness.

8. A jar of Amandine.

With this equipment anyone may keep the nails in excellent condition by the expenditure of a little time and trouble. The regular operation of manicuring need not be performed oftener than once a week.

The tips of the fingers of one hand at a time are covered lightly with Amandine. This is a preparation of gum arabic, honey, almond cream, almond oil, and perfumed with bitter almonds or attar of roses. It is too difficult to be made at home, and may be bought ready prepared. The white variety is the purer. The effect of Amandine is cleansing, softening, and healing. The hand is then soaked for several minutes in warm water, after which it is to be carefully dried. Next, the sheath around the nails is gently pressed back from the nail. This may be done, if it is free, with a towel or soft napkin. If it adheres to the nail, use the orange wood stick to free it, but never use a knife or a steel instrument. The nails are then cut with the nippers. The object to be sought in cutting is to secure a perfectly oval form, and to have the nails as nearly as possible all of the same shape. This may take time to effect by reason of previous bad habits. The accumulation of matter at the tips of the nails is to be removed by means of the orange wood stick. Never use knife or steel in doing this work. The orange wood stick is whittled to a flat chisel-like point for this purpose. The soft file is then used on the edges of the tips of the nails to give smoothness and evenness to the edge. Remove roughness and ink spots with pumice stone. Dis-

colorations of the nails may be removed by the use of a little vinegar or lemon juice.

A little rose paste is then placed upon the nail surface. It is made as follows:—

Rose Paste for the Nails.

Spermaceti,.....1½ ounces.
White Wax,.....9 drams.
Oil of Almonds,.....12 ounces.
Alkanet Root,.....2 ounces.
Attar of Roses,.....1 dram.

The first four ingredients are melted together and strained; beaten well until nearly cold; and the attar of roses is then added.

A fairly thick coating of powder is then dusted over the paste and the nails are polished with the chamois skin or the buffer. The rubbing or polishing is always to be across the nail, never up and down. The nail powder is made as follows:—

Powder for Polishing the Nails.

Silicon,.....8 ounces.
Oxide of Zinc,.....2 ounces.
Pulverized Pumice,.....½ ounce.
Rose coloring matter.

These are ground fine in a mortar and passed through a very fine sieve.

The preparations which are given may all be procured ready compounded at drug and department stores. Homemade remedies, while they are guarantees of the purity of the preparations, are usually difficult to manufacture.

During the rest of the week, vigorous scrubbing with the nailbrush and careful pressing back of the sheath around the nail is all the care required to keep the nails in good order, with, of course, regular daily cleansing of the extremities with the orange wood stick.

CARE OF THE ORGANS OF RESPIRATION AND OF THE VOICE.

Protection Against Cold.—The effects of cold are, perhaps, most commonly and severely felt in the organs of respiration and of the voice. They are: the larynx, the trachea, and the lungs. These organs require

constant and watchful care and protection against cold. The principal and best methods of protection are: frequent bathing of the chest and throat in cold water and subsequent vigorous rubbing; and by proper clothing. For those who are susceptible to cold in these organs, more than ordinary warmth of clothing is required. A woolen undervest or chamois jacket, or a few folds of newspaper, are effective means of protection against cold and winds, especially when driving. But such protection must not be worn one day and discarded the next. With some persons it is customary, after a fever square or mustard plaster has been applied to the chest, to wear for a time a protective covering of cotton wool upon which a little dry mustard has been sprinkled. Great care must be observed in leaving this off; and equally great care be taken that it is not worn too long. For these protective coverings owe their efficacy to the fact that they are nearly impervious to air, and, consequently, do not allow the emanations of the body to pass off freely.

Cold in these parts manifests itself, as in other parts, by inflammation, more copious secretions, and in efforts to allay irritation or to expel accumulated secretions by coughing. The condition of inflammation and the part affected are usually indicated in the name of the disease, by attaching the termination "itis" to the name of the part or organ so affected. Laryngitis is inflammation of the larynx; tracheitis is inflammation of the trachea; and so on. All of these diseases are dealt with in detail elsewhere. It is here desired to make clear the care that must be taken to avoid cold, chills, draughts, and exposure, which are certain to bring these diseases on.

Vocal Cords.—As the vocal cords are situated in the larynx, affections of these parts are generally accompanied by hoarseness or partial loss of voice. There is a form of inflammation of the larynx, which is caused by long, loud, and continued speaking. It is known sometimes as "Clergyman's Sore Throat." The vocal cords are not cords at all, but thin, delicate, muscular membranes stretched across the glottis. When they are used too long, or too vigorously, they become inflamed and cause pain and irritation of the throat. They are more in repose in speaking than in singing; and more in repose when there is slight modulation of the voice than when there is considerable range to the speaker's tone.

It is a great art, and one which all speakers and singers should strive to cultivate, to save the voice as much as possible. It is said that the admirable art of reading aloud pleasantly, easily, and for a length of

time, is passing away. The cultivation of the pure tone in reading and the habit of reading aloud for an hour at a time is a splendid vocal and throat exercise, if it is done properly. A pleasant speaking voice is a desirable possession; and it is something that every one may gain by proper practice and training. The cultivation of the voice is not confined to speakers and singers, but should be striven for by all, as one of the requisites of a good conversationalist.

Nose Breathing.—One great protection against cold and other affections of the throat and lungs is properly conducted nose breathing. Especially is this true in winter cold and in damp weather. The habit of taking the cold air through the mouth and into the throat and lungs without the slight but necessary warming that it gets in passing over the surface of the inner nose, is responsible for much disease.

Dangerous Occupations.—There are many occupations in which the workmen who carry on the several processes are obliged to inhale poisonous and injurious matter. The dust of coal mines; the particles in iron, lead, tin, and copper mines; the clay particles in pottery making; the dust from steel in grinding and polishing; the poisonous gases and vapors in chemical works and paper mills; the fire damp of mines; the chlorine and sulphur fumes in bleaching mills; the carbon bisulphide in rubber works; and the phosphorus in match factories, all exert a poisonous and injurious effect upon the workmen, despite the best preventive efforts and sanitary methods. All the forms of throat and lung trouble result from these occupations, and they materially shorten the lives of those engaged in them.

Cold Water Application.—The method of taking the cold water applications recommended to those who have delicate throats and lungs, and who are susceptible to cold in these organs, is not by gentle applications with a cloth or sponge, as in a sponge bath. More vigorous treatment than that is required. One must strip to the waist and splash the cold water repeatedly upon the chest and throat—at least a dozen times, more if it can be borne,—and follow it quickly by a vigorous rubbing with a coarse towel. It is a nerve treatment, and the involuntary gasp that is evoked by the splashed water is proof of both its efficacy and need. The glow and the after effects will abundantly compensate for the momentary discomfort. If cold water cannot be borne at first, let the taking of it be a matter of education, and begin with water as cold as can be borne, and gradually reduce the temperature of it. It is recognized by all medical authorities as the most effective means of invigorating the

parts and of rendering one able to withstand the cold and rigors of a northern climate. It is an infinitely better and safer treatment than the habit of burdening the throat and neck with wrappings.

Bad Sitting Position.—Incorrect habits of sitting are both a means of producing bad effects upon the organs of respiration and also an indi-

FIG. 10. CORRECT SITTING POSITION.

FIG. 11. INCORRECT SITTING POSITION.

cation of weakness in these organs. Any position of body which does not allow free play to the lungs and the unrestricted ingress and egress of sufficient quantities of air into them, is at once characterized as a bad one and should be corrected as speedily as possible. The outward signs of weakness and the effects of bad position are stooped shoulders,

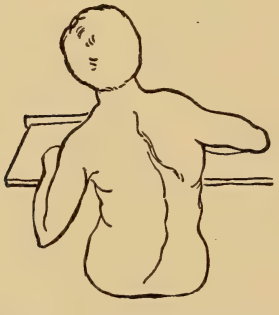

FIG. 12. DESK TOO HIGH.

FIG. 13. DESK TOO LOW.

flat or hollow chest and listless movements. Bending over the work at desk or table is the most prolific cause of these; and the results are more pronounced when the subject is afflicted with near-sightedness, which necessitates a more cramped position. One of the first points to which

attention should be directed is the proper height of the chair. It must not be too long in the legs, as that causes the sitter to keep the feet dangling a few inches from the floor, which interferes with the circulation or compels him to sit on the front edge of the chair in the effort to have the feet rest upon the floor. This latter position throws the upper part of the body forward over the desk or table. Where high stools are used, there must be an adequate and properly adjusted foot rest. There must also be a properly proportioned height of both chair and desk or table to insure comfort. If the desk is too low, the subject is sure to bend over; if the desk is too high, the work is brought too close to the eyes. Little children ought to be supplied not only with a high chair, but also with a small chair and a low table adapted to their size. This inexpensive recognition of their needs will go far towards preventing the evils of flat chests and round shoulders. The habit of crossing the legs while sitting is injurious, as it interferes with the circulation, even to the extent of putting the foot "to sleep." Sometimes the sharp edge of a chair presses too tightly upon the blood vessels of the legs and stops the circulation.

Bad Sleeping Position.—An unhealthy and injurious position in bed is the result of using too many pillows. For those whose chest development is not all that is to be desired, or for those who are flat-chested or round-shouldered, one small, flat pillow is sufficient. The pillow may properly be as thick as the distance from the neck to the outside point of the shoulder, which is sufficient to keep the head in the proper position when a person lies on the side. Lying propped up with several pillows after a day spent over a desk or table is certain to be the cause of the defects mentioned. Such a pillow as suggested and a not uncomfortably hard bed will insure a proper position or body for at least eight hours out of the twenty-four.

Correct Standing Position.—To insure a correct standing position that in use in the army may well be followed, for it is the result of years of experience and the survival of the fittest of all suggestions.

Stand squarely on both feet, heels in line, toes turned out, legs straight, hips slightly drawn in, body erect, chest expanded, shoulders square, head erect, chin slightly drawn in, and eyes looking straight to the front. The habit of taking this correct position and of maintaining it for several minutes at frequent intervals during the day will prove very beneficial. In order that one may realize how far one's ordinary, customary carriage deviates from this ideal, it is a good plan to stand

with the back against the wall or a door and align the body with it by forcing back the shoulders and head so as to touch it in all possible parts of the back of the body, and then allow the body to relapse into the customary attitude. The perceptible difference of position will guide one as to one's need of this exercise. The bad fit of clothing at the neck and shoulders is often caused by the unconscious assumption of a more than usual erect position of body at the time of fitting, and the subsequent relapse into the habitual position.

FIG. 14.
CORRECT STANDING POSITION.

FIG. 15.
INCORRECT STANDING POSITION.

Flat Chests and Round Shoulders.—For flat chests and round shoulders, the breathing exercise is an invaluable means of improvement. It is capable of many variations and modifications which, regularly performed, will undoubtedly be of great benefit.

EXERCISE NO. 1.

Stand erect, exhale deeply, bring the arms out straight in front of the body at full length, the palms touching. Slowly inhale as deeply as possible, and at the same time gradually bring the arms, with a perfectly horizontal sweep, out at right angles to the side of the body, and as far back as possible, at the same time rising upon the toes.

FIG. 16.
POSITION 1.

FIG. 17.
POSITION 2.

Maintain this position for a moment. Then slowly exhale as deeply as possible and bring the arms back gradually to the former position in front of the body, and sink to the flat of the foot again.

Light wooden dumb-bells, not exceeding a half pound in weight, may be used to advantage in this exercise. (See Figs. 16 and 17.)

FIG. 18.
POSITION 2.

EXERCISE NO. 2.

Drop the arms to the sides at full length. Exhale deeply. Slowly raise the arms at full length above the head, palms touching, at the same time taking a full, deep breath, and raise the body upon the toes.

Maintain the position for a moment. Then slowly exhale as deeply as possible, let the arms fall back to the former position at the sides, at the same time exhaling deeply, and sink to the flat of the foot again.

Dumb-bells may be used to advantage in this exercise. Fig. 18.

EXERCISE NO. 3.

Take a step forward with the right foot, slightly bend the right leg at the knee, keep the left leg straight. Bend the arms at the elbow and place the clenched fists on the chest. Exhale deeply and thrust out the arms alternately straight out to full extent, with as much force and in the same manner as in striking a punching bag. Inhale deeply and slowly.

Reverse the position by throwing forward the left leg and repeat as before. Figs. 19 and 20.

Dumb-bells may be used to advantage in this exercise.

EXERCISE NO. 4.

With dumb-bells. Let the dumb-bells rest lightly upon the shoulders. Bend the arms with the elbows close to the sides. The arms are then thrown out straight in front of the body. These movements may be performed both simultaneously and alternately. Fig. 21.

FIG. 19.
POSITION 1.

EXERCISE NO. 5.

With or without dumb-bells. Place the hands on the chest. Arms bent at the elbows. Exhale deeply. Throw the arms backwards at full length and inhale deeply.

The effect of this movement is the forcible expansion of the chest.

Exercise No. 6.

With dumb-bells. Let the dumb-bells rest lightly upon the shoulders. Arms bent and upper arm at right angles to the body. Alternately extend the hands as high as possible with a reaching motion above the head. Exhale and inhale deeply and slowly. Fig. 22.

Fig. 20.
Position 2.

Practise all of these exercises moderately at first; gently increase both speed and length of time as fast as it can be borne. Perform with loose clothing in a well ventilated room, preferably on rising and before retiring. Several of the exercises are to be taken at one practice to vary the monotony. Two or three months of faithful practice will work wonders in developing a full chest, and in straightening the shoulders. Keep up the splash bath of cold water upon the chest and follow it with vigorous rubbing. Let the bath precede the practice rather than follow it. If you are wearied or fatigued with work or other exercise, do not take your practice. Never take it just after eating.

Fig. 21.
Position 2.

For the rest of the day make up your mind that certain and positive means must be taken to remedy these defects. The will power must be exercised to break the bad habits, and the exercises which are taken must be faithfully followed up. It is comparatively easy to correct the faults and to inculcate good habits and an erect carriage in young people; this can also be very successfully conducted in the case of middle-aged persons; and even old persons need not despair. But forgetfulness, inattention, and irregular practice of the exercises will not do. Persistence and determination are required, and beneficial results are sure to accrue.

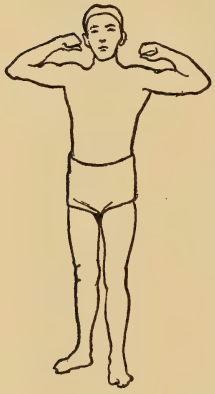

Fig. 22.
Position 1.

Running and skipping the rope are also excellent exercises for developing the chest in the case of young people who are flat-chested. But both exercises must be practised in moderation.

Singing and voice culture are strongly recommended in all cases of weak organs of respiration. Much care must be taken, however, in the case of young girls about the age of fourteen. With them it is a very easy matter to overdo and to defeat the very object for which these exercises are prescribed.

IMPORTANCE OF FRESH AIR AND VENTILATION.

As it has been said that a man can live three weeks without food, three days without water, and three minutes without air, it seems fitting that a consideration of the laws of healthy living should deal fully with the subject of air as being most essential and important.

The active, life-giving constituent of the air is oxygen gas, which forms about one-fifth of the volume of the atmosphere. It is this oxygen in the air which, in the process of breathing, is taken into the lungs and there purifies the blood. The other constituents of the air are nitrogen gas, which forms nearly all of the remaining four-fifths of the volume of the air and is an inactive, harmless gas; and several gaseous and solid impurities which are present in only very small proportions. Among these impurities are:—

Ammonia gas and its compounds, which are given off from the decay of animal and vegetable matter.

Carbon compounds, especially carbonic acid gas or carbon dioxide, which are given off during the breathing of man and other animals; by the burning of coal, wood, and gas; and by the decay of animal and vegetable matter.

Sulphur compounds, from the decay of animal and vegetable matter, and the burning of gas.

Dust, mineral, animal, and vegetable particles, which may be seen floating in a ray of sunlight.

Bacteria, which are living forms of animals, microscopic in size, and present in the air in all localities. The purest air and the freest from bacteria is found in mid-ocean, and at the highest elevations.

The impurities found in buildings and crowded localities are:—

1. Impurities from breathing.
2. Impurities from perspiration.
3. Impurities from burning coal, wood, and gas.
4. Impurities from the walls, floors, ceilings, and furniture.

Diseases Caused by Impurities in the Air.—Smallpox, measles, chicken pox, German measles, typhus fever, influenza, whooping cough, and mumps are undoubtedly spread by infective particles floating in the air and clinging to the walls and furniture of houses, as well as to the clothing of the occupants. Scarlet fever and diphtheria are generally so spread. Enteric fever, cholera, diarrhœa, dysentery, and yellow fever may be communicated in this way; and cerebro-spinal meningitis is apparently so spread. Hay fever is caused by inhaling pollen dust in the air. Bronchitis, pneumonia, phthisis, and asthma are caused sometimes by irritant gases and solid particles in the air. Sore throat, tonsilitis, and some forms of colic, may be contracted from more or less severe poisonous impurities.

Effects of Some Impurities in the Air.—Carbon dioxide, or carbonic acid gas, when breathed in full strength, kills instantly by a spasm or contraction of the glottis. When present in the proportion of only thirty parts in 1,000 parts of air, it produces slowness and feebleness of the heart's action and great difficulty in breathing; and fifteen parts have produced severe headache. It is breathed out during respiration and is the chief impurity in overcrowded and poorly ventilated buildings. As it is much heavier than ordinary air, it accumulates in old wells, cellars, mines, and other low places. When present in dangerous quantities, it may be detected by lowering a lighted candle into suspected places, where three per cent of the gas will extinguish the flame. If limewater be exposed in a saucer in a room, a white scum will form upon the surface of the liquid if this gas be present even in very small quantities.

Carbon monoxide is a more powerful poison than carbon dioxide. An extremely minute quantity causes headache, giddiness, and insensibility. This is the poisonous gas given off when the fumes of burning charcoal escape into a room, and it is thus, very frequently, the cause of death, both accidental and suicidal.

Dust from mechanical and metallic trades and manufactures produces, when inhaled by the workmen, asthma, bronchitis, consumption, blood-spitting, and poisoning.

Amount of Fresh Air Required.—It is estimated that an average adult consumes at each breath about thirty cubic inches of air. At the rate of seventeen breaths per minute, each adult will consume 425 cubic feet of air in each twenty-four hours. In order to insure getting rid of the used air, and of furnishing a sufficient supply of fresh air, it is necessary that an adult in repose have 3,000 cubic feet of fresh air every

hour; under moderate exertion, 4,500 cubic feet; and when engaged in hard work, 9,000 cubic feet per hour. As living rooms never approach a size of even 3,000 cubic feet, it follows that, in order to supply the needed amount, the air in an ordinary room must be changed several times in an hour, which number will depend upon the size of the room. In order, therefore, to ventilate properly, one must know the amount of air required by all of the inmates, and the space per head. Then one must know something of the quality and purity of the air that is to replace the foul air; for great care must be taken that it does not come from a contaminated source. Further, it must be admitted imperceptibly, so that a draught is not created. And especially must this care be taken when the temperature of the outer air is lower than that of the rooms. One of the hardest problems of ventilation is to see that the air does not merely come through a window and pass out by a door, but that the fresh supply is equally and fully distributed throughout the entire space.

Testing the Purity of the Air.—Under ordinary circumstances, tests of the purity of the air must be made by the senses and not by exhaustive chemical analysis, except in special cases. To investigate the purity of air in a room, one should enter immediately from the outside fresh air. Careful note should be made of whether the inside air smells fresh and sweet, rather close, close, or very close. In damp weather the odors, if any, will be more pronounced than in fair, dry weather. The sense of smell will also detect the presence of organic matter, the escape of gas, leakage of sewer gas, dampness or mustiness, and the presence of dust. This is as far as an examination by the senses can go; but it is far enough to tell whether the atmosphere of the house is conducive to health or not. A thorough examination will require a chemical, microscopical, and a biological investigation, by which means deleterious gases, dust, solid impurities, and bacteria may be certainly and accurately determined.

Effects of Breathing Bad Air.—If the air is extremely vitiated, as in the case of the famous Black Hole of Calcutta, or in overcrowded vessels with battened down hatches in stormy weather, death will result from the lack of oxygen and the presence of organic matter in the rebreathed air. In slighter vitiation, when foul air is breathed for a long time, the results are anæmia, weakness, depression of the vital forces, and interference with nutrition. Indirectly or directly, lung diseases develop in time; and headache, loss of energy and want of appetite are among the most marked results. So it follows that light and oxygen

are the most powerful agents in the eradication or the arrest of many such diseases as phthisis, typhoid, and other contagious diseases.

The foul air of crowded theaters, churches, and assemblies, especially at night when much gas is burned, causes anæmia, headache, and even stomach derangement when the air is breathed for only a few hours.

It is bad enough to breathe the air contaminated by the emanations from the lungs and bodies of healthy persons; but the effects are intensified and the danger increased when the impurities proceed from the bodies and the lungs of the sick and diseased. Not only is consumption spread in this way, and the other contagious diseases proper, but also erysipelas and gangrene.

The air of sewers has been known to directly and instantly produce death by asphyxiation, sewer gas poisoning, and to develop fatal cases of pneumonia. In smaller quantity, sewer gas, when breathed, produces lassitude, loss of appetite, vomiting, diarrhœa, prostration, and fever. Well authenticated instances have been recorded where food which had been impregnated by sewer gas was eaten with fatal poisoning results.

Marshes, in which much decay of vegetable matter always takes place, give off poisonous gases, such as marsh gas. Residents of such localities are always subject to malarial diseases and even to acute fevers and dysentery.

How to Ventilate.—Good ventilation requires that each occupant of a room shall have 600 cubic feet of space, and that the air in this space be changed five times every hour, so that he gets 3,000 cubic feet of fresh air during that time. It is a simple matter to estimate the number of occupants any room will accommodate comfortably. Multiply together in feet the length, breadth, and height of the room, and divide the product by 600. On this principle a sleeping room should be 11 feet long, 11 feet wide, and 10 feet high to accommodate two persons. Provision must be made for changing the air in such a room five times every hour. And this makes no allowance for lights. A single light in a room will vitiate as much air in a given time as ten persons will, for the light uses up the oxygen from the air. This is not true of incandescent electric lights, which use no oxygen.

In ordinary cases, the easiest and best way to ventilate is to open the window a little at the top and bottom. This allows the warm, foul air of the room to pass out at the top, and the cooler, fresh air from outside to enter at the bottom, in obedience to the well known law of

physics. In sleeping apartments, an additional supply of bedding can be used in cold weather to make sleeping comfortable in the lowered temperature caused by ventilating.

The effect of slight openings at top and bottom of windows may be realized when it is known that a wind traveling at the rate of two miles an hour, which is barely, if at all, perceptible, will sweep across a room twenty feet wide with sufficient rapidity to change the air in that room 548 times in an hour. There is always some air finding its way in and out of a room through the loose fitting window frames, by the opening and closing of doors, and through the chimneys. In houses heated by furnace, with cold air shafts communicating with the outer air, some also finds its way in by that means. But all of this ingress and egress of air is by no means sufficient. Regular and systematic methods of ventilation must be adopted in every home to so frequently change the air throughout the house that that within may be as pure as that outside,—which is the ideal ventilation.

Those who are careful about the air they breathe are often commiserated by others, or are ridiculed about their "hobby" by those who have never stopped to think of that stupendous, marvelous process which we are accustomed to speak so lightly of as "breathing." Let such persons carefully consider these facts:—

1. Each human being takes at least seven million breaths a year.
2. He inhales one hundred thousand cubic feet of air annually.
3. He purifies over three thousand five hundred tons of blood in that time.

All of this is done without worry, weariness, or even conscious attention on his part.

How to Breathe Properly.—Respiration, or breathing, consists of two more or less unconscious or involuntary acts: inspiration, the taking of air into the lungs; and expiration, the act of breathing out. The fact that these acts require no attention on our part is the chief reason why they are not performed properly. The lungs, as previously stated, consist of a collection of six hundred million little air cells, or bladders, into which the air is drawn by inspiration. When little short, catchy breaths are taken, some of these cells in the deeper parts of the lungs are neither emptied of the used air nor filled with fresh air. It is only in the deep panting after violent exercise, in involuntary sighing, or, best of all, in the deep, deliberate, voluntary inhalations that all should practice every day, that they are brought into use. When we consider

that most persons use only about one-half the full lung power, and at the same time fill that space with impure air, is it remarkable that so many suffer from the long train of impure blood diseases and an anæmic or bloodless condition?

Children should be early taught to breathe through the nose and not through the mouth. If a child develops the habit of "mouth breathing" a physician should examine it for adenoid growths, which close up the back passages of the nose. The removal of these growths is a very simple surgical operation, and it is not only advisable but absolutely necessary to the health of the child that they be removed as early as possible. Nose breathing is the natural method, and to this end the nose is lined with hairs to catch particles of dust and to prevent them from entering the lungs. When cold air is breathed through the nose, it passes over a large surface, which warms it slightly before it enters the lungs. When very hot air is breathed, such as the air near furnaces of rolling mills and other factories, as well as that of hot, sandy deserts, it is slightly but sufficiently cooled by passing over the extensive surfaces of the nasal passages. It also passes over the surface covered by the nerve of smell,—the olfactory nerve,—by which bad odors, escaping gas, and other impurities are detected in time to warn one of their presence.

There is no better form of exercise for the development of the chest, and for the improvement of the general health, than the fixed habit of two or three times every day taking a number of deep breaths. This can be best done during a walk. Some begin by inhaling during four or five steps, and exhaling during the next four or five. In a very short time the act of inhaling or exhaling may be made to endure for six, seven, and even ten steps. By this simple exercise the chest muscles, and the intercostal muscles between the ribs, are exercised; the diaphragm is pushed down and the abdominal muscles are brought into action; the size and elasticity of the chest are increased; the shoulders are raised and squared; the lungs expand, and all of the six hundred million air cells are filled with fresh air and emptied of the impure air and the poisonous carbonic acid gas; but, above all, the oxygen is brought into contact with the impure blood and freshens and revivifies it, so that it goes coursing, under the heart's action, through the body and limbs, carrying new life and vigor and health to every part.

When one begins this exercise, the measurement of the chest should be taken at forced expiration, and again at forced inspiration. The difference of these measurements is called the mobility of the chest or

the chest expansion. It is the measure of the chest capacity. Gymnasium records show that those whose mobility at the beginning of this exercise was barely one inch, have, by regular practice, developed an expansion of three and even four inches and more. This breathing exercise may be taken in a well ventilated room with open windows, both on rising and before retiring, as well as during one's walks, with immense physical advantage.

During the breathing exercise taken in the morning or at night before retiring, a beneficial modification may be adopted. With the hands at the sides, exhale as deeply as possible. On slowly inhaling raise the hands to the full extent above the head, as in the illustration given. This form of exercise is to be repeated slowly ten times.

FIG. 23. POSITION 2.

CARE OF THE NOSE.

Cleanliness.—The first essential in the care of the nose is cleanliness, and this is one of the lessons which should be taught as early as possible to children. Many an hour of wakefulness or of restlessness is passed by reason of obstructions in the nose caused by children's inability to remove the natural secretions. These latter are more profuse during a cold in the head, and the difficulty of breathing is greatly augmented. If these accumulations are moistened with a little warm vaseline carefully inserted into the nostril by means of a soft camel's-hair brush, and the bridge of the nose be rubbed with a little vaseline or camphorated oil on retiring, much of the inconvenience will be removed and the breathing be greatly assisted. It is necessary that the nasal passages be kept free and unobstructed at all times, but especially in the case of a child who has contracted the unhealthy and pernicious habit of mouth breathing, which, once developed, may persist during life. Then, on the score of cleanliness, the habit of using the handkerchief should be taught to children. Some parents, in following up this lesson, pin a handkerchief by one corner to the child's shoulder, where it is both out of the way and close at hand when needed. The frequent removal of the secretion by the handkerchief will prevent the substance from hardening and thus obstructing the passages; and will also prevent a child from contracting the offensive habit of picking the nose; although the

itching of the nose in children is regarded as an indication or symptom of stomach irritation or of worms.

Cold in the Head.—The most serious affection of the nose is cold in the head, which frequently develops into catarrh. The precautions to be taken against catarrh consist not so much, if at all, in the care of the nose, as in the care of the body and the prevention of exposure to draughts and dampness. Still, the manifestations of the disease center in this organ and the adjacent parts. The delicate mucous membrane of the nose and of its connections are very sensitive, and, being well supplied with blood vessels, is soon the seat of painful inflammation, and the natural secretions of the nose are very much increased thereby. This inflammation and the increased flow of the nasal secretion are to be regarded as the curative force of Nature upon the cold.

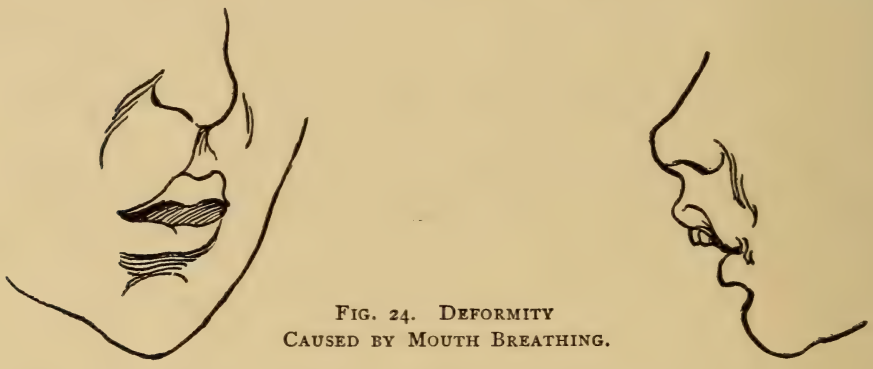

FIG. 24. DEFORMITY CAUSED BY MOUTH BREATHING.

Mouth Breathing.—Mouth breathing is usually developed in children by an obstruction of the nasal passages. The commonest of these in childhood are the adenoid growths. These spongy growths form at the back of the nasal passages and are easily reached through the mouth. Their removal is not attended by much pain or inconvenience. If a child display a tendency to mouth breathing, accompanied by a dullness of facial expression, he should be at once examined by a physician. Adenoid growths usually develop around the third or fourth year.

Polypus of the Nose.—Another growth develops later in life in the nose, and it also obstructs the passages and causes mouth breathing in adults. It is called polypus, from two Greek words meaning many feet. It was erroneously believed to have many roots or branches. It is an enlargement of the mucous membrane, and is attached to it by a small stem like that of a mushroom or toadstool. Its removal is a very simple

surgical operation, consisting of burning it out with caustic, just as a wart is treated.

Hairs of the Nose.—The hairs of the nose are designed to keep out much of the dust and the solid impurities of the air. These hairs often grow so long as to cause them to protrude from the nostril. The habit of pulling them out by the roots is very dangerous and differs from pulling hairs out of the outer skin. The hairs of the nose grow from the delicate mucous membrane, and violence to this is attended with the great danger of setting up an inflammation, which may be the direct cause of exciting a malignant growth. The fact that the pulling out of the hairs from the nose is nearly always attended by a sneeze, or at least by a desire to sneeze, is a proof that Nature resents such treatment, and that the act is an irritating one. It is much better to cut the long hairs off, if they are annoying, as this is sufficient to remove the unsightly appearance.

Blowing the Nose.—Medical experts are calling the attention of the public to the importance of performing the nose blowing operation in a scientific and hygienic manner. First one nostril and then the other should be blown without undue violence.

Doctors state that the two nasal passages should never be closed at the same time. If they are obstructed, as in the case of a cold, the back of the throat is filled with compressed air, and this, together with the discharge and the microbes which it contains, may be driven through the eustachian tube into the middle ear and lead to serious results.

A great authority on the subject used to forbid his patients to blow their noses when suffering from a cold; but this course is hardly one which will commend itself to those who are in the habit of catching colds. The best advice would seem to be that when it is necessary to blow the nose, the blowing should be done gently.

Atomizers and Douches.—It is frequently necessary to administer washes or lotions to the deeper recesses of the nose. This may be done either by means of an atomizer, the tube being placed well up in the nostril, and the liquid sprayed into the nose, the patient meanwhile assisting the process by snuffing the liquid up or extending its range by strong nasal inhalations; or the nasal douche is used. In this application, the passage from the mouth to the nose is closed and the liquid impelled by some force flows in at one nostril and out at the other. Such applications and douches are of great value in cases of chronic catarrh.

Foreign Substances in the Nose.—When foreign substances lodge

in the nose and cannot be extricated by simple means, the services of a physician would better be procured. He will probably remove the object with a small flattish probe having a bent end. This he slips up the nostril past the object and draws it out. Beans and similar objects, which are likely to swell after lodgment, are difficult to remove. Sometimes the object may be forcibly driven out by closing the free nostril and energetically forcing the breath out.

CARE OF THE EAR.

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Cold in the Ear.—The ear is an organ of great complexity and of extreme delicacy. The most delicate parts of it are placed well within the skull, and are both abundantly protected and difficult of access.

Under no conditions should cold water ever be allowed to enter the outer ear. Not only excruciating earaches but permanent deafness has resulted from sleet and snow beating against the exposed ear. Whenever water is permitted to reach the inner portion of the ear, it should be at least tepid. So, in sea bathing, it is a wise precaution to protect the ear, with pieces of cotton wool, against the entrance of cold sea water.

Cold draughts are always to be avoided, as they are the most fruitful cause of earache, and may lead to inflammation of the ear, with accompanying discharges and abscesses. Even the hair around this organ should not be allowed to remain wet after bathing lest a chill reach the delicate membranes of the ear.

Wax of the Ear.—The ear secretes a peculiar wax, which, so long as the secretion is normal in quantity, and is not increased by inflammation, is Nature's own way of cleaning the inner tube of the outer ear. The only assistance expected from us in the way of cleansing the ear is to keep the outer shell of the ear and the entrance into the ear tube clean. This wax in the ear, when Nature is ready to dispense with it, peels off in tiny flakes, which, on dropping off, leave the tube perfectly clean. Attempts to clean the tube of the ear by such means as the corner of a towel or cloth screwed up and pushed into the ear, are only a cause of irritation and inflammation, and of an increased and abnormal supply of wax to be secreted. These attempts also serve to solidify the wax and to cause it to press unduly against the drum of the ear, with painful and dangerous results.

Cold in the head, inflammation in the throat, and of the ear tube, also cause an increased secretion of wax in the ear. The inflammation

of the throat, caused by the inhalation of smoke by cigarette smokers, also produces similar effects. When this inflammation of the ear tube takes place, it causes a tickling in the ear, and one of the first sought-for means of relief is a pin, hairpin, match, pencil, or similar article which will remove the wax and thus stop the uncomfortable sensation. All of these means are attended by very great danger; for there is not only a certainty of hardening and solidifying the wax in the ear, but very great danger of injuring or even breaking the drum of the ear, which is a very thin and delicate membrane stretched tightly across the tube. The hardening of the wax is one of the chief causes of temporary or partial deafness. The wax should never be removed; the proper treatment consists in stopping the cause of the inflammation in the ear tube that excites the secretion of the abnormal amount of wax. Relieve the cold; cure the inflammation in the throat; stop the smoking; but do not remove the wax from the ear.

Hardened Wax in the Ear.—When from any improper treatment of the ear, or from disease, the wax has hardened so that Nature cannot remove it in her own way, it is to be softened by washing with warm water and castile soap applied with a syringe. When thoroughly dried, a few drops of good oil are to be poured into the ear. With this assistance it will be removed in a short time by natural means. This hardened wax in the ear produces difficulty in hearing.

Noises in the Ear.—Colds are responsible for partial deafness, and also for some of the noises in the ear. The circulation of the blood under abnormal or diseased conditions produces many of the sounds and ringing in the ears. Some medicines, such as quinine, cause a roaring in the ears.

There is a curious connection of the inner ear with the mouth by means of the eustachian tube, which opens into the upper part of the throat. Its office is to equalize the air pressure on the drum of the ear. In inflammation of the throat, this tube becomes involved and communicates the disturbance to the ear; this is another cause of noises in the ear. But the familiar ringing in the ears is caused by interruptions in the circulation of the blood.

Deafness in Children.—Many young persons are suspected of mental dullness, when the real trouble is partial deafness. They seem bright enough when anticipating a word or some direction, but when taken unawares they do not respond quickly. It is only right that, before such are regarded as mentally deficient, they be subjected to careful tests

of both ears. It will be found, in many cases, that the hearing of one or of both ears is impaired.

The sequelæ, or after effects, of scarlatina, measles, and scarlet fever, often cause deafness or some affection of the ear.

Boxing a Child's Ear.—Permanent and serious injury has frequently resulted from the criminal habit of boxing a child's ears. In some cases the drum of the ear has been ruptured, causing permanent and total deafness; abscesses have been induced, with running at the ears, which have caused the destruction of the drum of the ear; and fatal results have sometimes followed this brutally careless punishment. When there are so many other effective forms of punishment offered to those who believe in that sort of discipline, it positively assumes the magnitude of a criminal act to adopt so dangerous a means.

Foreign Bodies in the Ear.—Foreign substances that become lodged in the ear usually require the attention of the physician. Attempts at removal by inexperienced persons who are not well acquainted with the anatomy of the part are very likely to produce serious effects.

Sometimes insects enter the tube of the ear and cause extreme fright and alarm, even to the extent of convulsions in young children. The insect should first be killed by pouring into the ear about a teaspoonful of warm oil; and it may then be washed or floated out by tepid or warm water.

Tests of Hearing.—The sense of hearing is one of the latest senses to be developed in infants. This tardy development often occasions unnecessary alarm on the part of parents. Preyer says that if at the age of four months a child does not turn the head in attention when a loud noise is made behind its back, such as clapping the hands, or by speaking in a louder tone than usual, justifiable fears for the child's hearing may be entertained. Lack of response or of attention on the part of an older child when it is spoken to is not always caused by defective hearing. It may arise from concentration of attention or from absorption in work or play. This is a power that will prove too valuable in after life to warrant any attempts in the way of distraction. But where fears or suspicions of impaired powers of hearing appear to be well founded, a few very simple tests will soon decide the question. A few words or sentences spoken at a fair distance in a moderate tone, at a time when the child is not expecting them, may reveal the existence of the defect. When a person is expecting to be called or spoken to, or when his attention is fixed upon the face of the speaker, he is often enabled to

anticipate the speech, and the test will fail. The ringing of a distant bell, or the playing of music in another part of the house, may be made use of to test in some measure the imperfection of the sense. But in all tests, care must be taken that an absence of attention be not mistaken for defective hearing.

The human voice is the best and most practical of all the tests of hearing, for that sense is most used in interpreting voice sounds. The tests should be conducted by both full voice and by whispers. If, however, the space in which the tests are made is limited, whispered words and sentences are to be used. Distances should be marked off on the floor so that a fairly accurate note may be made of the distance at which sounds are heard by the patient. The subject is placed in a chair at one end of the room or hall, and is directed to keep his eyes closed during the tests. He is instructed to repeat such words and sentences as are audible to him immediately upon hearing them. The person conducting the test is to preserve the same degree of loudness during the test at each repetition of the word. He advances slowly toward the subject, repeating the word or sentence selected, until he comes within the range of hearing. It is to be remembered in applying the test that some words, because of the preponderance of vowel and consonant sounds, are more audible at a certain fixed distance than are others. So that when the subject has heard one word at a distance of, say 25 feet, it does not hold that all subsequent tests must be made at the same distance. The person conducting the tests is to return to the former distance and select another word—the numerals are very good for this purpose—and note the distance at which each particular word is heard. Faithful records must be kept in order to observe, at another time, any improvement of the hearing power.

The normal ear hears a whisper at a distance of from 10 to 40 feet; the names of the numerals are heard at from 8 to 40 feet.

The ticking of a watch may also be used as a test, the subject being directed to raise his hand as soon as he hears the sound. There is no fixed distance at which a watch may be heard, as the sound varies so much in different watches. The same watch, however, must be used in subsequent tests in order to make a comparison at different periods of any value.

There are many other methods of testing, such as using a series of tuning forks of different pitch; as some persons hear high-pitched tones better than lower ones. Whistles, and an instrument known as the

acoumeter, are used, but chiefly to assist the specialist in locating the cause of partial deafness. Rods, held in contact with the bones of the skull in the vicinity of the mastoid process, are also used for the same purpose. But their use and the deductions made from such tests are technical. By the voice and watch tests any person may easily learn whether the services of an aurist are required in any case of impaired hearing.

Helps to Hearing.—The mechanical aids to hearing are chiefly of two kinds: the ear trumpet, and the artificial eardrum. The former is a horn-like contrivance, which serves to collect the sound waves and to present them to the eardrum with greater directness, force, and concentration. The collection of the sound waves is the office of the enlarged cartilage, commonly called the shell of the ear. From its shape and position, it collects the air waves, upon which the transmission of all sounds depends, and causes them to enter the orifice of the ear, where they strike upon the tympanum or eardrum. When this organ is ordinarily sensitive, the hearing is good. Not infrequently, persons whose hearing is defective, are seen to place the hand behind the ear in the form of a shell in order to catch more of the sound waves, and thus to

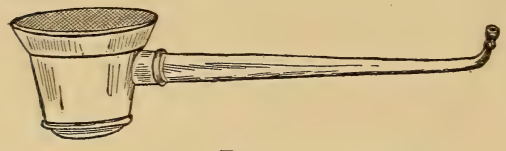

FIG. 25.
EAR TRUMPET.

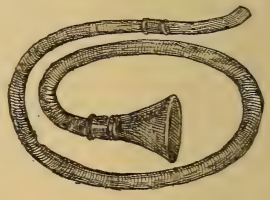

FIG. 26.
EAR TUBE.

improve the hearing. The ear trumpet is only a modification of this service, and, where any degree of vibratory power exists in the eardrum, is an efficient aid. Artificial eardrums aim to provide a vibratory membrane as an aid to an impaired natural one. They are not always as efficacious as they are claimed to be. Further aids to hearing have taken the form of telephones placed in the rear chairs in churches and assembly rooms, whereby those who, either from defective hearing or from a too remote location, are precluded from hearing the speaker, are materially benefited. These telephones are connected with a sounding board or with receivers close to the speaker. As yet the microphone, designed to intensify very low or inaudible sounds, such as the walking of a fly, has not been adapted to the relief of the afflicted. The mega-

phone and speaking trumpet, inasmuch as they intensify sounds and supply some control by the speaker over the direction of the sound waves, also serve to make sounds audible.

CARE OF THE EYES.

If one has passed middle age without trouble with the eyes, or without impaired vision and the necessity of wearing eyeglasses or spectacles, one is tolerably safe. But when one considers the great army of spectacled school children and young persons, one feels that they are not so much the victims of faulty school conditions as of the carelessness of their parents and ancestors, and pity is evoked for the handicapping legacy which they have inherited.

Children's Eyes.—It is one of the first duties of parents and teachers of young children to ascertain whether or not a child is suffering from any impairment of sight, or from a weak condition of the eyes. Where such exists, it is the duty of the parent and the teacher to see that such a child is placed in a good position in the schoolroom so that it can see the blackboards easily, and share in the school exercises with comfort and convenience. Many a child has unjustly been considered stupid or of slow mental development when the trouble consisted of some form of poor sight, which, from a back seat, prevented the child from clearly seeing the lesson on the board, or the teacher. We all know how intently we observe a person in whose conversation we are interested or whose discourse we are trying to follow. The removal of such a child to a more advantageous position has often resulted in rapid school progress.

Need of an Oculist.—Where eye or sight trouble is suspected in either a child or an adult, no time should be lost in consulting a good oculist or optician. He will make a thorough and reliable examination, and will prescribe the proper treatment or the sort of glasses the patient should wear. To such perfection and reliability has this art been brought that good and trustworthy service is within reach of all. Irreparable injury has resulted from the haphazard choice of glasses and spectacles, and from the purchase of such from irresponsible persons. Blindness, even in degree, is such a serious deprivation that instant and proper care must be exercised to save the sight as much as possible.

Defects of Vision.—It must be remembered that the eye does not see. It is the organ by which the rays of light are received, and an

image of the object or objects within the range of vision is received upon the black curtain (the retina) at the back of the eye. This sensation is communicated to the brain by the optic nerve. The cognizance of that image by the brain is what we call sight. Now, the perfection of sight depends very largely upon how that image is received upon the retina. If the rays of light from the object focus exactly upon the retina, the sight is good; it is normal. That condition of exact focus is called by opticians, emmetropia, and such an eye is said to be emmetropic. If the rays of light do not exactly focus on the retina, the condition is called ametropia; and it is with this condition that we are concerned in trying to understand defects of vision. Emmetropia does not much concern us, because that is the normal condition of the eye. But the condition of ametropia is the irregular condition upon which three common defects of sight depend. If the rays of light from an object do not focus exactly upon the retina, but fall upon it in such a way as to focus at some point behind it, if they focus at all, the condition of far-sightedness, or of hyperopia, as the optician calls it, results. The effect of this condition is that the image, instead of being clear and distinct as it is in the emmetropic eye, is blurred and indistinct. The person sees well the distant objects but cannot see those distinctly which are close at hand. The optician prescribes for this condition a double convex lens, that is, one which bulges on both sides. As the rays of light pass through this they are brought to a focus at a point on the retina instead of behind it.

When the rays of light, instead of focusing on the retina, as in the emmetropic eye, or focusing at a point behind it, as in the hyperopic eye, focus at a point a little distance in front of the retina, the condition is one of near-sightedness, or of myopia, as the optician calls it. The result of this is that the person is near-sighted. The optician corrects this condition by prescribing a double concave lens, that is, one which is hollowed out on both sides. This causes the rays of light which pass through the lens to come to a focus farther back than when they pass through the unaided eye. So the rays are made to focus on the retina instead of in front of it, and a clear image results.

There is a third condition which is in some respects a combination of two of the conditions already mentioned. It is a condition where some of the rays of light received by the eye from an object focus exactly on the retina and others do not. That condition is known as simple astigmatism. Or some of the rays may focus behind the retina and others in front of it, when the condition

is known as mixed astigmatism. The effect of this condition is a blurred image instead of a distinct one. The optician corrects this condition by prescribing a lens which bulges out on the side nearest to the eye and is straight up and down on the outer side. Astigmatism is a very common defect of vision, and may exist in only one eye without a person being conscious of it until it has advanced to a serious stage. The illustration here given is a form of astigmatic chart. It consists of a number of parallel lines radiating from a center. On looking at these lines, one eye at a time, if the sight is astigmatic, some of the lines in the defective meridian will appear much blurred while others remain clear and distinct. If the eye is normal, and no astigmatism exists, all of the lines are sharp and clear. But it is found on examination that the very great majority of eyes are more or less astigmatic.

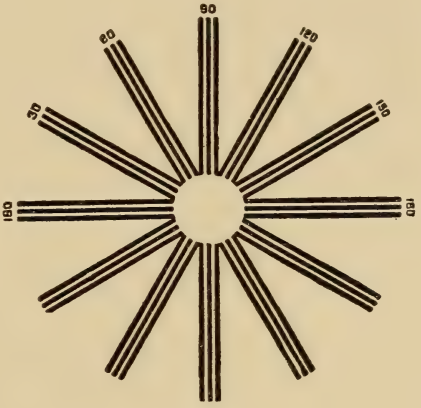

FIG. 27.
ASTIGMATIC CHART.

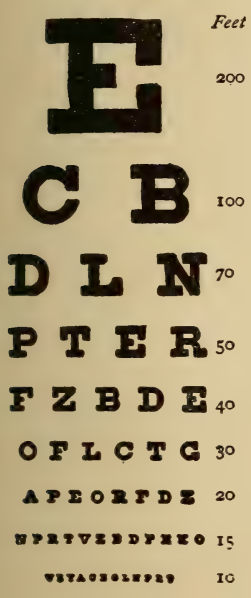

FIG. 28.
GREATLY REDUCED FORM OF CHART FOR TESTING SHARPNESS OF SIGHT.

The tests for sharpness of sight, or acuity of vision, as the optician calls it, is conducted by means of a chart containing letters of different sizes which the patient is directed to read at a distance. Upon the ability to do this is based the decision of normal or of defective vision. This chart is shown in reduced size in the illustration. The figures to the right of the letters indicate the distance at which the letter should be seen by one with normal sight. The card is hung upon the wall in a well-lighted position, and the subject is seated as far from it as the accommodations will permit, but at some known distance, say 20 feet. The subject is then asked to read the letters in the line of smallest sized type which he can see plainly at that distance. His sharpness of vision is then expressed in the form of a fraction having 20, the number of feet that he is distant

from the card, as a numerator, and the figures on the right of the line of type that he has just read, as the denominator. This fraction expresses his visual fraction. For instance, suppose he is 20 feet away from the card and can read the line marked 20. The visual fraction is $\frac{20}{20}$ and the patient has stood the test. But suppose, at the distance of 20 feet, he can read no smaller sized type than the line marked 30. Then the fraction becomes $\frac{20}{30}$, and, as this is a less fraction than $\frac{20}{20}$, his sight is pronounced defective. Each eye is tested separately. The fact that the patient successfully passes this test is no assurance, however, that his vision is perfect. It is, in that one respect, but there are other tests to which he must be subjected.

There is a small type test card, such as is here given:—

It is the duty of parents and of teachers to see that all of the conditions to which the children are exposed in school are such as will best promote their physical as well as mental growth and comfort.

A patient less than 21 years of age should read this with ease when held at a distance of from 5 to 7 inches from the eye. If he cannot do so, but is obliged to hold it at a greater distance in order to see it clearly, there are indications of far-sightedness or of hyperopia, and his eyes should be examined carefully. If a middle-aged person cannot see it easily at a distance of from 10 to 12 inches, the same condition exists, and reading glasses are necessary.

Protection of the Eyes.—Nor is it alone in the direction of the remedy and the improvement that great care must be exercised. There are the strongest obligations upon all to protect and care for the eyes at all times.

The first rule to be observed in reading and writing by either natural or artificial light is to see that the light falls over the left shoulder upon the book or paper. When one is choosing the location for a desk in an office, of a writing table in a room, or a seat for reading, this point is to be carefully observed. Ascertain the source and direction of the light from windows, then place one's self accordingly. By so doing the glare and brilliancy of the light does not shine into the eyes, but the paper or book is well lighted. When the eyes get both the direct light as well as the reflected light from the book or paper, there is an undue and unnecessary strain upon them. The eyes themselves may be in deep shade so

long as the page is sufficiently lighted; and this is why green shades for the eyes, shades for student's and other lamps are used. The light is thrown on the book or paper but the eyes are shielded from the glare by the shade.

Poor Light.—Reading by twilight or by fire light, not as a habit, but only on occasions when one has been caught in the most interesting part of a book, is far too great a strain for even good eyes to endure. When children offend unconsciously in this respect, it is better to quietly provide a suitable light as the quickest and easiest remedy, instead of ordering the book to be put away at such a climax, though a word of admonition and the pointing out of the certain injury which will result, should not be neglected.

Strong Light in the Eyes.—Some, when in deep thought or in reminiscence, have a habit of looking long and steadily into a fire or at other bright lights. This constant glare of light is very trying to the eyes. It is true that there is a marvelous provision in the eye itself for protection against the admission of too much light into the eye, by a wonderfully contrived shutter controlled by the "nerve of accommodation," as it is called; and this automatic contracting and dilating of the shutter under the varying power of light is a certain protection against the admission of too strong a light, yet it is not sufficient to counteract the effect or to prevent the injury which the habit just mentioned is sure to cause.

Most emphatic protest must be made against the carelessness of some mothers and nurses in this regard with the eyes of helpless infants. Metaphysicians all agree that the first object which a young infant sees clearly is a light; and that it naturally manifests great interest in it, and is attracted by it. But that fact, however true, will by no means pardon the thoughtlessness which permits a young helpless child to be placed for hours on its back in its carriage with the full glare of the sun shining upon its blinking and unprotected eyes. Observation will show that this is a very common offense on the part of young and inexperienced nurse girls into whose care young children are so frequently and for so long a time intrusted. It is at this period, while the sense of sight is slowly developing, that the greatest protection is needed; but, unfortunately, it is at this very time that the child's well-being in this regard is so often disregarded.

Care During Convalescence.—During convalescence from such diseases as measles, scarlatina, and typhoid fever, there is very special

need of all possible protection of the eyes. The sequelæ, or after effects, of these diseases are sometimes more serious than the disease itself. It is well if the patient escape without some serious affliction which usually falls upon a weak or impaired organ. These diseases are extremely debilitating, and the eyes, in common with the other organs, share in that debility, and are the last of the organs to recover from it. The light must be softened during the early days of convalescence. Later, a green shade or smoked glasses should be worn until the power and tone of the eyes are restored.

Fine Print.—The caution against reading very fine print at any time, but especially in a dim light, while quite as important as ever, is not so necessary in this day of beautiful printing, clear, large type, and good book-making.

Reading on Trains.—There is a very great temptation to while away the tedious hours of a long railroad trip with an interesting book. But this habit of reading on a train is one of the most fruitful sources of injury to the eyes. The shaking of the book by the motion of the car causes the distance of the book from the eye to constantly vary. The effort of the eye to adjust itself to this ever-varying distance is intensely tiring. The up and down motion of the page also causes the eye to follow the line with difficulty. With this there is also the ordinary right and left motion of the eye. So that when we stop to analyze the amount of work which the eye is obliged to perform by these three motions under trying circumstances in an hour of such reading, we realize the great tax upon it.

Fine Work.—Close and continuous application to art needlework, embroidery, lace making, and fine sewing generally, is also trying to the eyes by reason of the fine stitches, the necessity of counting stitches and spaces, and very often the delicacy of pattern and trying, dazzling colors. In such occupation there is also the bending of the head over the work, with the attendant discomfort and injury of tight neckwear to impede the circulation of the blood. Positive and lasting injury to the eyes results from such strain and abuse.

Floating Specks.—Nearly every one suffers at some time from little black, floating or falling specks which come within the range of vision and dance over the page when reading. These are called *muscae volitantes,* or dancing flies. They are an indication of a debilitated and weakened system, and of a need of tonic and upbuilding treatment. They are caused by a lack of uniformity in the consistence of the liquid

contained in the eye, which is produced by lack of nutrition or by a weak condition of the body.

Need of Resting the Eyes.—The great sign that the eyes are being overtaxed is the aching of the eyes and pain in the eyeball. This warning must not be disregarded. Rest of the eyes is then the great need. All, perhaps, have known the great relief to tired, watching, aching eyes that comes from looking out into the black, inky darkness of night, where no object is seen to occupy the eye. Frequent rest of the eyes, especially at night, is positively requisite whenever the eyes show the slightest signs of fatigue.

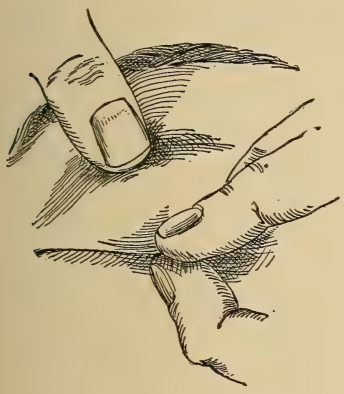

FIG. 29.

FIRST STEP IN ACT OF EVERTING OR TURNING OUTWARD THE UPPER EYELID.

Bathing the Eyes.—There are a few simple, harmless substances which may be used with benefit to bathe the eyes when they are tired or slightly inflamed from too steady use or from the action of the wind. Among them are: cold water, hot water, a weak solution of salt and water. When the eyes are much inflamed, a cold, weak solution, or infusion, of green tea; or a teaspoonful of Epsom salts in a quart of warm water; or the addition of a little rose water to the bath will prove helpful and beneficial. But under no circumstances should any other lotion or eyewash be applied without a physician's advice.

Foreign Substances in the Eye.—When dust, cinders, eyelashes, and other substances lodge in the eye, do not rub it, for that only irritates the eye, inflames it, and increases the pain. Winking the eye also has the same effect. Keep the eye quietly closed, and, as the irritation increases the flow of tears, the chances are very great that they will wash the irritating body out of the eye. If they do not, one may take the upper lid at the middle part by the lashes and draw it gently down over the lashes of the lower lid, and allow it to slip back over them on its way back to place. This

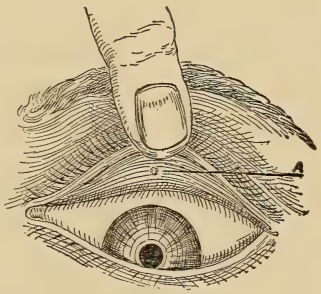

FIG. 30.

UPPER EYELID TURNED OUTWARD. *A*. THE FOREIGN BODY.

will often brush the foreign body out if it is lodged on the inner upper lid. If the offending substance is under the lower lid, that can be easily pulled down and the body removed. If it adheres to the ball of the eye under the upper lid, the latter may be rolled back over a lead pencil and the substance brushed off with a camel's-hair brush. The finger nail should never be used for this purpose, as it usually contains poisonous, irritating matter which only increases the injury. Eyestones are supposed to possess marvelous and mysterious power to extract substances from the eye. Their only use, however, is to raise the lid from the eye and to allow the tears to wash out the foreign body. Flaxseed will accomplish the same result. If the body is a sharp splinter of metal or similar object, which clings to or becomes embedded in the eyeball, the services of a physician are to be at once procured. Particles of lime in the eye are painful, not only by reason of their sharp corners, but chiefly on account of the burning and caustic effect upon the delicate membranes. Wash the eye at once with a little dilute vinegar, which, being a weak form of acetic acid, neutralizes the caustic effect of the alkaline lime, and, uniting with it, forms a harmless salt. The most effective means of administering a bath, lotion, or wash to the eye is by means of a specially made eye cup, which fits the hollow of the eye and insures long and steady application.

CARE OF BONES.

Bone undergoes a remarkable change from infancy to old age. In infants there is an excess of cartilaginous matter in the bones, which renders them very soft and little liable to fracture. It is during this early period that malformation of the bones is likely to occur. Bow-legs may be easily caused by permitting heavy children to stand or walk at too early an age. There is a great desire on the part of some parents to have a child walk or stand as soon as possible, and to this end they encourage it to support itself by a chair when the bones are soft, pliable, and unable to bear the weight of the child's body. Rickets, which sometimes affect children, is caused by a deficiency of mineral matter in the bones, as a result of which they bend under the weight of the body. This condition is a manifestation of a weak constitution, and the disease is often aggravated by living in damp and ill-ventilated homes. Such children demand the best hygienic care; fresh air, sunlight, good, nourish-

ing food, such as abounds in phosphates, cereals especially, and comfortable clothing.

Curvature of the Spine.—Curvature of the spine is the result of bad positions in sitting and sleeping, whereby the spine is bent from its nat-

FIG. 31. BOWLEGS.

FIG. 32. KNOCK KNEES.

ural shape. The cartilage which separates the vertebræ, or individual members of the backbone, become compressed on one side and renders the distortion permanent.

Bones of the Feet.—Malformation of the bones of the feet is likely to result from the bad habit of sitting on the feet, which is a common practice with some children. Malformation is also frequently caused by ill-fitting shoes. The toes are pinched to such an extent that they override one another, and the joints sometimes become enlarged. The narrow sole compresses the arch of the foot, and the high heels strain the ankle and thrust the weight of the body forward.

FIG. 33. CURVATURE OF SPINE.

Cracking the Knuckles.—The disagreeable habit of cracking the knuckles by pulling and pressing them causes an unsightly enlargement of the joints.

The Bones During Old Age.—In old age there is an excessive deposit of earthy matter in the bones, in consequence of which they become very brittle, and much more liable to fracture than at earlier periods of life. Not only that, but, when fractured, the bones of old persons knit more slowly and with greater difficulty. This in conjunction with the failing sight, and other infirmities of age, enjoins the greatest care on the part of old people.

Ligaments.—The bones are united, and in some cases held together, by bands of tough cartilaginous matter known as ligaments. Sudden wrenches and twists, often caused by slight accidents and by small objects, result in the stretching, straining, or sundering, of these ligaments, which produces a sprain or a dislocation. Usually the tendon or the ligament, when broken or torn away from its fastening at the end, heals or grows fast again. In such cases, the full use of the member is restored. But very often the lacerated or disengaged end does not attach itself again, and the use of the joint is impaired. The pain of a sprain, which is often more severe than that of a fracture, is caused by a wrenching of both the ligaments and the muscles. The swelling which ensues is caused by the escape of blood into the tissues, which also causes the discoloration. In a dislocation the force of the twist, fall, or blow is sufficient to cause a displacement of the bones of the joint, rendering any movement or use of the joint impossible.

Diseases and Injuries to the Bones.—Sprains, dislocations, and fractures are the most familiar results of injuries to the bones. It is hard to tell which is the more to be wondered at, the slight accidents which often produce the most grievous consequences, or the marvelous escapes from serious injury. Children escape certain injuries by reason of the softness of the bones; old persons are more liable to such injuries because of the greater brittleness of the bones. Intoxicated persons make no effort to save themselves when falling, and the bones are not rigidly fixed by the tenseness of the muscles with which sober persons attempt to break the force of a fall. Sleepwalkers, sleeping children, and others, have bad falls with no serious effect, as they, too, are unconscious of danger, and make no effort to save themselves.

A bone is subject to death even while in the body. Such a state is known as necrosis of the bone. Death of a bone is caused by anything which interferes with the circulation of the blood in the bone. Such interference may be a severe injury, the separation of the covering of the bone (the periosteum), inflammation of the bone, of the marrow,

or of the periosteum. Death of the inflamed bone always causes a secretion of pus, which finds its way to the surface. The most serious condition in which death of the bone results is that commonly known as hip-joint disease. In this the upper part of the long bone of the thigh dies, and its removal by surgical means is required. Inflammation of the kneejoint is often produced by very slight knocks or blows, so slight that they are forgotten until the pain in the joint sets the patient thinking. A stiff kneejoint is very often the result.

CARE OF THE MUSCLES.

The proper care of the muscles of the body is largely a matter of good, nourishing food (for which see page 26) and of exercise.

Exercise.—The direct effects of exercise upon the muscles are an increase in their size, density, and compactness, and a marked darkening of the color of the flesh. With insufficient exercise, the muscles decrease in size and become pale, flabby, and soft. The dark color of an exercised muscle is due to the larger supply of blood which it acquires through use. For this reason we do not choose dark-colored beef, as this darker color is an indication of much exercise and consequent toughness. The increase of a muscle in size by use is well illustrated by the great development of the breast muscles of pigeons, which are so constantly brought into use in long flights. The flesh becomes discolored and dark from the freer circulation of blood in the parts. The breast of a chicken is smaller in comparison, and is light-colored from lack of use, while the legs and parts most exercised supply the dark meat.

Violent and long-continued exercise is injurious because there is greater waste and destruction of tissue than food and bodily functions can repair in the same time. There is a great difference between exercise for health and the systematic training of a professional athlete. A man who trains all of the time, and keeps himself always "in condition," becomes prematurely old and usually breaks down in middle life.

One of the most important laws of health is aimed directly at the man who leads a sedentary life: A sedentary life needs daily, moderate exercise, never carried to the point of fatigue. "No organ of the body, no set of organs, nor the body itself, can be maintained in a normal and healthy condition unless its parts are fully exercised." The exercise of the muscles is not limited in beneficial effects to the muscles themselves; but regular

and systematic exercise is of the utmost importance to the full development and the well-being of the body as a whole.

Special Value of Exercise.—The muscles of the body, as has been stated, cannot be strong, and cannot perform their functions well, without regular and intelligently planned exercise. This is true of both the involuntary and the voluntary muscles. By involuntary muscles are meant those which act regularly, without requiring any effort of the will power or the attention.

The lungs are benefited by exercise chiefly in the direction of throwing off the carbonic acid gas more liberally and completely. The necessity of drawing long breaths which exercise entails is the means by which this is done. The statement that a healthy body is an impossibility without proper breathing and a sufficiency of good, fresh air, will bear repetition, so important is this point as a preliminary in the acquisition and retaining of good health. The purity of the blood depends upon plenty of oxygen, and the health of the several organs and the parts of the body depends upon the purity of the blood. Deep, efficient breathing of fresh air is the first rule of good health to all, but especially to those who follow sedentary occupations.

The circulation of the blood is benefited by the increased action of the heart which is induced while exercise is being taken. The heart beats more rapidly, the pulse is stronger and fuller. The blood is sent coursing to the extremities, the brain is well supplied with fresh, rich blood, and the whole system, both physical and intellectual, responds to the exhilaration. The lawyer, the student, the business man, who have wrestled with perplexities and problems in the office and the study, find great clearness of mental perception in the refreshing walk. Many a knotty problem or difficult question finds easy solution on the golf links, by the seashore, or in the country lane. If the exercise has been violent or carried to the point of fatigue, it will be observed that the heart and the pulse rate rapidly fall below the normal. It is then that the care of the body in the way of clothing and rest is most needed. Excessive exertion may cause palpitation and valvular disease of the heart as a direct consequence of the great demands that are then made upon that organ and of its effort to quickly repair the waste which goes on so rapidly. If disease of the heart is known to exist, it is suicidal to indulge in violent exercise. Even the act of running for a train or car, or of walking rapidly uphill, may be the cause of a rupture of some weakened or diseased organ or part of the heart; and this explains

some of the cases of sudden death which follow such indiscretions. But this danger should not lead to the other extreme, the neglect of all exercise. There are many forms of gentle, moderate exercise which are perfectly safe for those with "heart trouble" to practise with benefit; for a deficiency of exercise is often the direct cause of a weakened heart and, in some temperaments, of fatty degeneration of the heart.

The skin during exercise becomes red because with increased circulation the blood is forced with unusual vigor to the surface capillaries, or minute blood vessels, in all parts of the body. As the temperature of the body increases, the perspiration glands begin their work of cooling the body. At this stage another very important law of health must be observed. These pores must be allowed to close gradually. To effect this, as soon as the exercise is completed, heavier, protective clothing must be thrown around the body and a gentle walk should be taken in order, as it is often said, to let the body cool off slowly. Really it is to prevent the pores of the skin from closing too rapidly and thus checking the perspiration too soon. Sudden cold, or cooling, sitting in a draught, or similar exposure closes the pores suddenly. The perspiration is then checked and has no escape except through the kidneys. This sudden interruption of one of the body's spontaneous efforts to adjust the temperature to new demands and unusual conditions results inevitably in a cold in one or more of its dangerous forms. The same result is brought about by throwing one's self after heating exertion on damp grass or on the cold ground, or by taking a cold bath, or swimming when overheated, or indulging in similar indiscretions. Young people who are not informed of the danger of such practices are inclined to think that those who advise against them are treating them with a coddling, unmanly care. But the horse trainer knows better than to neglect to exercise his horse under a blanket after a race, and never thinks of turning him at once into the stable or of letting him drink cold water after a hard drive. A dog, however, may swim and lie in the water as much as he pleases when suffering from the heat, for he has no pores on his body to close; he does all of his perspiring by means of his mouth, and this accounts for his deep panting, open mouth, and protruding tongue, on hot days and after violent running.

The nervous system is benefited mainly by the flow of blood to the brain. Whatever improvement of the nerves, whether motor, sensory, or sympathetic, results from exercise, or, indeed, from any cause, must come from the brain; for that organ controls the entire nervous system.

That which improves the brain, improves the nerves; and that which injures the brain, injures the nerves. Moderate exercise renders the mind clear and active. Change of scene, of occupation, and of associates, have a most beneficial effect along the lines of rest, for mental rest may proceed simultaneously with bodily activity. Deficient exercise displays its effects upon the nervous system by morbid excitement, ennui, melancholy, and mental hallucinations, especially in the case of persons of a highly-sensitive nervous organization. Exercise in the fresh air and sunlight are large and important factors in the treatment of nervous diseases.

The digestive system is much benefited by judicious exercise. The appetite increases because there is a waste of tissue to be repaired, which does not occur to such an extent in a state of rest or of inactivity. The food digests better; and its absorption into the blood after digestion is both greater and easier. The circulation of the blood in the liver and in the abdomen is improved, and this is attended by a better performance of the functions of these important organs. On the other hand a deficiency of exercise lessens the appetite and diminishes the digestive power. The food which is taken into the body is not fully acted upon and it remains in the stomach, where, to a greater of less extent, it decays rather than digests. This means an impairment of the bodily health and a long train of disorders of which constipation and poisoning by the absorption of fæcal matter are not the least. A great and mischievous error is committed by many at this stage in seeking a remedy in the free use of purgatives and aperients. Not only do people bring this deplorable condition upon themselves by neglect of the simple and natural means of exercise to prevent it, but they then seek to use force to compel the bodily organs and functions to conform to these unnatural and unhealthful habits of living. Such unreasonable forms of relief are often called a means of assisting nature. There is practically no case of constipation brought on by an indolent habit of life or by sedentary occupation that will not, in time, yield to the treatment of moderate exercise, regularly performed, aided by a liberal, fresh fruit diet.

Perhaps the most noticeable effect of exercise upon the bowels is the relatively small amount of refuse or waste matter that is thrown off by them as excreta. This is a convincing proof of the benefits of exercise upon digestion. By its means more of the nutritious matter is extracted from the food and is absorbed into the system. There can be no true

condition of health when a certain amount of nourishment supplied to the body is, through neglect and carelessness, to a large extent thrown away unused. It is one of the first principles of commercial economics to get the largest possible returns of manufactures from a given quantity of raw product; and so it is one of the first principles of physiological economy to derive as much nourishment as possible from a given quantity of nutritious food.

Quantity of Exercise.—Attempts to prescribe the amount of exercise a healthy adult should take in a day are based upon as accurate, as possible, an estimate of the work done in a day by a man engaged in manual labor in the open air. Such is regarded as the most healthful life possible. A man so engaged will put forth in a day as much strength or force as will suffice to raise from 250 to 350 tons one foot. It would seem then that the minimum of daily exercise to be taken by an average man should be not less than the expenditure of sufficient force to lift about 150 tons one foot. This force is expended in a walk of about nine miles. Taking into consideration the fact that every one in the pursuits of daily life puts forth considerable exertion, this amount is to be reduced according to the amount of force so expended. No rule can be laid down which will cover all cases, but it is possible, from the facts stated above, to fix the amount required in any case with tolerable accuracy.

Form of Exercise.—Much has been said and written about this and that series of "movements"; and many ingenious forms of physical exercises have been devised, with and without elaborate apparatus and contrivances. But it would appear that many of these new forms have been made interesting and attractive in order to coax us to give up a small part of our time each day to such exercise as is really necessary to the healthful development and proper nourishment of our bodies. It is not sufficient that an intelligent person be told that if he move his arms or his body in this or that direction, so many times each day, that this or that result will be reached. Knowing only so much of one or more of the many forms of physical culture so strongly advocated, and so speedily superseded, it is no wonder that thinking, reasoning persons tire of them and so soon neglect them. With the full and plain description of anatomy and physiology given in another portion of this work, anyone who desires to improve the general condition of the body, or to supply any special deficiency, may do so with intelligent effort and persistence in the very simple forms of exercise here recommended. Unless

one knows the end one is trying to reach, and the means one is employing to reach that end, there is small likelihood of either intelligent or persistent effort, without which practically nothing of lasting benefit can be accomplished.

Walking.—For general development, vigor of body, and the full maintenance of health, no form of exercise can compare with walking. This exercise, so much demanded in business and domestic life, is, when properly conducted, one of the most beneficial forms, and the most easily practised. Care must be taken that when performed, whether in the office, the home, the street, or the country, every step be taken correctly. For, apart from the great physical benefits which it confers, one must not forget the charm of an easy and graceful carriage. There are those who most conscientiously take a formal walk for exercise every day, during which they carefully practise all the correct observances which they wantonly neglect all the rest of the day.

So awkwardly and inefficiently is this commonest of all acts performed by the average man, that the first thing taught to one joining the army is how to walk, and, incidentally, how to stand, correctly. All recruits are obliged to go through the drill of attention and the "goose-step" to insure that erectness of carriage and that ease and grace of motion for which a well set-up soldier is noted.

A good walker carries the head erect with the chin slightly drawn in or down; shoulders square; chest raised; hips drawn in; toes pointing slightly out; heels striking the ground first, afterward the ball of the foot, evenly; the walker finally springs from the toe after the manner of the square heel-and-toe of the pedestrian. The exaggeration of any of these points is, perhaps, more ludicrous and ungraceful than the disregard of them. One is not always conscious of faults of gait which are apparent to others. These can be corrected by soliciting kindly criticism from one in whose judgment we have confidence, and, in this way, learning our shortcomings.

Walking and the mode of carrying the body constitute an indispensable part of one's appearance in public, and one owes it to one's self that this be, as far as any personal effort and painstaking can make it, graceful, easy, healthful, and calculated to create a favorable impression.

It is, perhaps, hardly necessary to say that no one can walk well or gracefully in uncomfortable and ill-fitting shoes. It is to be remarked in this connection that as much, or more, actual discomfort may be suffered from wearing a shoe that is too large as from one that is too

small, to say nothing of the added ungainly appearance. Too much care cannot be paid to the proper fitting of the foot; nor too little attention to the dealer's assurance that some detail of poor fit will be all right after the shoe has been worn a few days, when the shoe will take the form of the foot. Too often, under such circumstances, the foot takes the form of the shoe.

Slow walking, or sauntering, is really more tiring than is a brisk steady gait. In walking uphill the body should be inclined forward and the steps taken should be short.

The habit of starting out to walk to a certain point with the fixed purpose of walking just so far for the sake of exercise and with no other thought than that of performing a duty, is not generally beneficial. Nor is it well to go alone when it is possible to have congenial companionship. In the solitary walk the mind is less likely to be freed from the cares of business or domestic duties or from study or worry. But be sure that the companion is congenial; an uncongenial companion may render an otherwise beneficial walk quite harmful. One should try to walk in places where there is something interesting to engage one's attention.

It would seem worse than idle to recommend this form of exercise purely as a means of developing the muscles to those who in the discharge of their duties are obliged to walk a great deal. If a walk is devoid of recreation, pleasure, change, or the benefits of fresh air, by all means let some other exercise be chosen. Still, there remains to such persons, in common with all who walk, the need of observing that each step be taken with marked attention to correctness of gait and grace of bearing, which is so essential to both health and charm.

After a comparatively short time, if strict attention be paid to these points, the habit of correct and graceful walking will be so confirmed that it will be well-nigh impossible to fall back into a slouchy or ungainly gait or faulty and ungraceful carriage.

Under no circumstances should walking, or, indeed, any form of exercise, be carried to the point of extreme fatigue. There is such a thing, however, as a healthy weariness which insures all the pleasure of rest and of sound sleep, which makes walking and similar forms of exercise Nature's remedy for insomnia. By all means let the walk be taken as a recreation, not as a perfunctory or disagreeable duty to be performed. It is the basis of golf which, after all, is but a game of a long walk with pleasant companions and the recreative adjunct of skill

and the correct estimate of distance. The camera, the botanical tin for collecting specimens, the sketchbook, or the paint box may be the form of recreation added to the walk. To the observant mind and the lover of nature, there is a rich fund of enjoyment and food for rational contemplation in a walk by field and stream. Nor is the exercise to be confined to fine weather alone. A good bracing walk in stormy weather has its charms and pleasures for one who is properly clad and protected against all inclemency. But one must be sure that there is no exposure.

Running.—This form of exercise is largely restricted by custom to the young of both sexes and to men. As it is more violent than walking it produces more marked results. The circulation of the blood is greatly increased and, with it, the temperature of the body and the number of respirations per minute. It is possible with regular practice to develop in a very short time the power of keeping up an easy dog-trot for several miles. While the entire body is greatly benefited by running, the special development is in the legs. But the gentle, regularly sustained back and forward motion of the arms in a long run is one of the best possible preliminary exercises for arm improvement. The arms are bent at the elbow and are carried at the sides of the chest with a very slight motion. Violent motion of the arms in running is a useless expenditure of strength, which is better conserved for legitimate use. Fast running for a short distance, or sprinting, consists in the power of taking long steps very rapidly. But long distance running at a moderate pace is much the better form of exercise, although, as a sport, it spoils one for short distance running. The behavior of the breathing in long distance running is very peculiar, in that the runner's "wind" fails him after a short distance has been covered; then, after a short period of rather labored breathing, the "second wind" comes and, usually, stays with him. It is conceded by runners that the use of tobacco very materially injures the "wind" of runners and athletes generally. Sometimes running is attended with pain in the side; upon the occurrence of this the runner should instantly cease exercising until such pain passes off. The great danger to be avoided is in exposure on cooling off after a run. A wrap should be thrown around the body and a walk should be kept up until the temperature of the body is reduced. Drinking cold water and throwing one's self on the ground when overheated are often followed by very serious consequences.

Physical Exercise for Young Persons.—No formal physical exercise or gymnastics should be encouraged before the fifth year. From

that up to the eighth year such exercises as are employed must be very simple. The child is growing fast and the muscles in their imperfectly developed state cannot perform double or intricate movements. The games that children play, and play so poorly compared with an older person, are both a sufficient exercise and at the same time a proof of their inability to bring several sets of muscles into efficient use at the same time.

From the eighth to the twenty-first year is the time for formal physical development. That is the period of life when the body will most easily respond to right efforts towards carriage and development. The youth is well able to take part in those games which call forth a variety of complex movements of both body and mind.

The exercises which are given below are designed for general muscular and physical culture. The following points should be observed in the practice of them:—

1. They are best practised in the morning on rising.
2. Let the clothing be light and loose.
3. Drink plentifully of water both before and during the practice.
4. Lower the windows from the top and raise them from the bottom. Have plenty of air but no draughts.
5. Do not perform the motions in a listless manner. Act as though you were meeting resistance in the motions. Play one muscle against another. This does not mean a jerking motion, but a steady pull or strain of the muscle. If the exercise is taken in this way the use of weights or dumb-bells is not advised. The artificial resistance is better than the weight.
6. Perform with accuracy and precision and with a determination to get the most possible good out of them.
7. Rest for about a half minute between each movement.

Exercise I. *Bending and Stretching.*—Raise the hands to the full extent above the head, palms to the front. Stretch as high as possible. Keep the body erect and the upper part of the body raised as high as possible with a reaching motion. Bend the body at the hips and try to touch the floor with the tips of the

Fig. 34. Position 1.

Fig. 35. Position 2.

fingers without bending the knees. This may be impossible, but come as near doing so as you can. Straighten up, restoring the hands to the former position. Repeat slowly ten times.

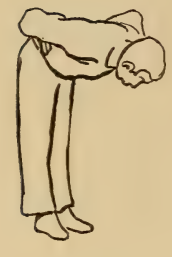

FIG. 36. POSITION 2.

EXERCISE II. *Bending the Body Forward and Back.*—Place the hands on the hips, with the fingers towards the front, and thumbs back. Bend the body forward until it is at right angles with the legs. Keep the back straight. Then bend backward, supporting the back with the hands still upon the hips. Begin with ten times and gradually increase to thirty. This is an excellent exercise for a weak back or for reducing excessive fat on the abdomen.

EXERCISE III. *Rotating the Body on the Hips.*—Place the hands on the hips, arms bent at the elbows, thumbs to the rear, fingers to the front. Turn the head so that the chin is over the right shoulder, eyes looking to the right. Slowly and with resistance to an imagined opposing force, turn the body on the hips so that the right shoulder comes to the front. Reverse the exercise by letting the right shoulder go back and the left shoulder come to the front. If this exercise is performed rapidly and with a swing, the rotation of the body on the hips will be greater in extent but not so beneficial as when performed slowly and with resistance. Repeat ten times at first with a gradual increase in the number of times and in the vigor of the exercise. The muscles of the back and of the abdomen are greatly benefited by this motion.

FIG. 37. POSITION 1.

EXERCISE IV. *Bending the Body Sideways and Back.*—Raise the hands above the head; bend the body at the hips toward the right side, head and chin raised so as not to interfere with the circulation and the breathing. Straighten up and carry the body as far backward as you can, with the head thrown back. Repeat the movement ten times at first; gradually increase in vigor. This strengthens the muscles of the abdomen and the back.

EXERCISE V. *Bending the Body to the Side.*—Stand with the arms hanging naturally at the sides, body erect. Bend the body to the right, at the same time reaching down as far as possible with the right hand, and raise the left arm straight up and in line with the right hand. The eyes are to be directed downward. Straighten up and bend

down as far as possible to the left, reaching downward to the full extent with the left hand and raising the right hand above the head, with the eyes directed downwards. Do not let the body incline backward or forward in this practice. It is a beneficial exercise for the muscles of the abdomen and the back. Repeat it ten times, gradually increasing.

Exercise VI. *Abdominal Exercise.*—Lie at full length on the floor upon the back. Place the hands upon the hips. Imagine that a weight rests upon the feet. Slowly raise the feet, without bending the knees, so that the legs are at right angles with the body. Gradually and slowly drop the feet and legs to the original position. Repeat ten times and gradually increase. When rightly performed this is a test of the strength of the abdominal muscles. Do not overdo it.

Fig. 38. Position 1. Fig. 39. Position 2.

Exercise VII. *Arm and Body Exercise.*—Lie full length on the face on the floor. Place the hands, palms downward, on the floor under the shoulders. Slowly raise the body from the floor to the full extent of the arms, keeping the tips of the toes on the floor. Very slowly lower the body to the floor without resting it upon the floor, and repeat the exercise only five times at first, gradually increasing it.

Fig. 40. Position 1.

Exercise VIII. *Development of the Calf of the Leg.*—Place the hands upon the hips. Raise the body on the toes. By bending the knees, slowly lower the body to a sitting position still resting on the toes. Resume the first position. Begin with ten times and gradually increase to thirty.

Exercise IX. *Going Upstairs.*—This exercise can be put into practice as the occasion requires. There is no more beneficial treatment of the legs than this when properly done. We have been doing it so regularly and from such an early age that we do not realize that the act is a very nice and difficult balancing feat. If we stop to think of the number of falls a child receives while he is learning the art of going up and down stairs, or if we think of the

trouble we nearly all experience on strange stairs in the dark, we shall begin to appreciate its difficulties. So great is the difficulty of preserving the balance of a body, the center of gravity of which is constantly changing, that when the first Japanese embassy visited Europe several years ago, there was not one of its members could go up and down stairs without clinging to the hand-rails. And yet those people had gone up and down ladders at home in their houses with agility. In going upstairs incline the body forward. Many do this incorrectly by simply dropping the chin upon the chest, which interferes with the breathing and the circulation. Take the first stair with the left foot, raising the body at the same time on the toe of the right foot. This is important, as it exercises the large muscle of the calf of the leg. Do not place the flat of the foot on the stair. Come down on the toe and carry the weight of the body on it. Ability to go up a flight of stairs on the toes is an indication of vigor and freshness. The flat foot on the stairs is an indication of illness or of weariness. On going downstairs, carry the body erect, not inclined forward in the act of looking at the steps; let the eyes do that while the body is erect. Let the weight be carried on the toes. The muscles that are employed in this are the walking muscles, but there is the added weight of the body. In going up one flight of stairs the subject is not only going forward, but is raising the weight of the body a height of ten or twelve feet. It is like climbing up a very steep hill with a good footing. Of course a woman is at a great disadvantage in going upstairs with one hand full of skirts and a few things in the other hand, and few of them perform the act well or gracefully. But there are many who so appreciate the great benefit of the exercise that they seldom use an elevator except in long trips.

FIG. 41.
POSITION 1.

FIG. 42.
POSITION 1.

FIG. 43.
POSITION 2.

Bicycling.—It must be remembered that the set of muscles which are brought into play in bicycling are not the same as those used in walking. The bicycle muscles are the same as the skating muscles. And we all know that, no matter how well developed the walking muscles may be, we feel keenly the soreness and stiffness which follow the first day's hard skating. The large muscle of the calf of the leg is a walking muscle, but does not come into use to an appreciable extent in either bicycling or skating. This is largely because there is slight need in the latter acts of raising the weight of the body upon the toes. So that both bicycling and skating are good supplemental exercises to that of walking and running.

FIG. 44. POSITION 2.

THE NERVOUS SYSTEM.

There is such close and intimate relation between the mind and the body, between the nervous system and the bodily functions, that whatever injures or impairs the one, in similar measure injures or impairs the other. This was fully appreciated by the ancients, who regarded "a sound mind in a sound body" as the ideal of the perfect development of mankind. Good food, fresh air, and proper proportions of exercise and rest, of work and recreation, are as necessary to the development of the brain as to the growth and sustenance of the body.

Sleep, natural, regular, and profound, is the first duty we owe to the nervous system. It is during that period that Nature is building up again what has been lost during the waking hours. The safe rule is to sleep until one wakens naturally. No fixed number of hours can be set. Much depends upon the occupation;—brain workers and children require more hours of sleep than do hand workers and old persons. The best sleep is that induced by Nature and unattended by dreams. Sleep obtained by drugs or medicines is not so beneficial as is natural sleep. It is supposed that the medicine by reaction disturbs the nervous system and neutralizes the value of sleep. Under no circumstances should drugs be used without the sanction of a physician. To those suffering from the fearful affliction of insomnia and driven almost to desperation by their terrible condition such advice may seem unsympathetic and

trite. But rather a thousand times the ills of insomnia than the fearful thraldom of the drug habit. One suffering from insomnia should be very careful of his every act, but especially of those within six hours of the usual time of retiring. No tea or coffee, no study, no more worry than possible, no excitement during that time, and as much resignation and calm, deliberate fighting the demon of unrest as can be summoned, will go far towards a conquest;—not, perhaps, the first night, or the second, or the third; but persistence must prevail. Let all of this be accompanied by a hot bath, as hot as can be comfortably borne, to allay nervousness. Many are the suggestions for a remedy, some very ridiculous, but nearly all pointing to the direction of concentrating the mind upon something other than upon one's unfortunate condition and of striving to forget one's sufferings. Insomnia, or sleeplessness, is a symptom or sequel of other conditions. Permanent relief can be found only by the removal of the cause. Temporary relief is afforded by such treatment as will draw the blood from the brain and so prevent its activity; for the brain cannot act without blood. Such means are the hot bath, a brisk walk before bedtime, moderate diet, and outdoor exercise.

Indiscretions in eating and drinking are always accompanied by sleeplessness. The consequent disordered stomach and more or less acute indigestion are the causes to be removed. Whatever the cause it must not be ignored or temporized with; for sleeplessness is one of the most alarming symptoms of a nervous or mental collapse.

Neurasthenia, or Nervous Prostration, is the breakdown of the nervous system after a period of nervous excitement or strain. It is Nature's rebellion against bad treatment,—either enforced or willful. It is the almost general custom to ascribe it to overwork. The human body is so protected and safeguarded by bountiful provisions and adaptation of parts to their uses, that no taxing of its powers beyond its strength is possible by legitimate means. There is no such thing possible as prosecuting work along legitimate lines to injurious lengths. No amount of healthy work can be held responsible for nervous collapse. There are always other reasons for a breakdown. If, during the hours which should be properly devoted to rest and sleep, there are social and intemperate excesses, irregular hours and late suppers; or if there be worry in any of its many phases; undue excitement; mental agony or distress; any of these, alone or in combination, may in time produce this condition. Invariably it is one of Nature's last warnings that all

of her plain and simple laws of health are being ruthlessly disregarded, that all of her rights are being persistently invaded; and that it has gone on until she most positively protests against a continuance of it.

That this nervous collapse is far too prevalent is attested by the number of sanitariums and health resorts established throughout the country. It has come to be considered as one of the inevitable results of present day conditions of life, both domestic and business. There are, however, indications of a protest being gradually but steadily entered against life and its hard conditions and exactions. Business men are showing an inclination to go slow; to observe shorter hours; and to take more recreation and regular vacations. The unwisdom of inordinate ambition and its fierce struggle is gradually being borne in upon the minds of all classes; and moderation, the keynote to all permanent and enjoyable success, is still recognized as the safest course to pursue. It is not the struggle for existence that brings such a state of health to the business man so much as the struggle for high place. To the student with mediocre ability, to the business man of limited capital and few connections, to the professional man with slight popularity, to the social aspirant with small income, the spur of unreasonable ambition and of too lofty aspiration brings the worry, the struggle, and the disappointment that kill. In face of such penalties and sufferings the resignation and contentment which make one satisfied to walk in that state of life to which it has pleased God to call one, is almost enviable.

The treatment of neurasthenia consists chiefly of rest, sleep, change of air and scene, and removal from the customary surroundings and associations. Sympathetic and cheerful companions, good diet and nursing, proper medical treatment, and, above all, the necessary discipline of regular hours, baths, medicine, and complete change of the manner of living, will, in time, restore much of the former good health. But even then, great care in the mode of life, observance of the laws of health, and moderation and much self-denial will be needed to prevent a recurrence which will in the second case be more easily provoked than at first.

Overwork.—As previously stated, this term is much misused. There is, however, a form of overwork concerning which parents should be very careful; that is the overtaxing of the young mind before the mental powers are fully developed. There is a great temptation, especially when a young child shows an unusual degree of precocity, to

encourage a too rapid mental growth. There is more than ordinary danger of this in the case of an only child who is brought up in the company of his elders and is denied the companionship of young children of near his own age. The more nearly equal mental attainments of such companions is a safeguard against such severe mental strain as the intercourse with grown people too often excites. Such a child is usually sent to school at too early an age and so the process of forcing is continued, to his great detriment. Remembering the very intimate relationship existing between the mind and body, it must appear that such a child's intellectual development is being hastened at the expense of his physical growth. The only encouragement that such a child should receive is along the lines of observation. He should be encouraged to gather his knowledge of his environment and of the things nearest to him by the senses of touch, sight, and hearing.

When the brain is developed and the mental processes are active, there is slight danger of a boy or girl suffering from overstudy. Given a good physical development a parent need have little concern with the possibilities of a child injuring himself by a too close application to study. In the case of children of weak constitution and of a nervous temperament, care must be taken that such a one devotes as much attention as possible to physical culture and outdoor life. If the body is built up and kept up, the brain will grow strong at the same time.

A great deal has been said of the injury of "cram" for examinations. Now, the ability to master a subject, or to gain a good knowledge of its principles in a short time and under pressure, is an accomplishment that should not be despised. The lawyer does just such work on every case he takes up. He must get a grip upon a subject within a very short time which will enable him to intelligently conduct his case and even to examine and to cross-examine experts in the interests of his client. This knowledge is put aside when the case is through and a new subject is taken up in the same way. The medical man and other professional men are often called upon to do the same thing. In the case of children the great objection is that the method is not pedagogically sound and is at variance with the proper principles of education. There is slight danger of any injury, either physical or mental, resulting from it.

Anger and Passion.—The nervous system is so delicately balanced and so intimately connected in its control of the functions of the bodily organs, that violence of temper and manifestation of extreme passion and motion are constitutional in their disturbing effects. History is

full of even fatal results from an outburst of anger. Sylla, Valentinian, Nerva, Wenceslas, and Isabeau of Bavaria all fell a prey to a sudden access of passion. The numerous instances in all ages of temporary insanity with attendant crimes of murder, and self-destruction induced by violence of passion, all attest the utter derangement of the brain under their influences. It is a complex metaphysical and physiological question which confronts one in an attempt to fully explain all of the reasons why the body, its organs, functions, and the general health are so shocked and disturbed by anger, hate, and the painful affections of the soul, and even by intense joy. Certain it is that the blood is suddenly and violently congested in the lungs and brain. The nerve centers of the brain and spinal column are paralyzed, the heart beat and the breathing are interrupted and decline. The liver is so affected that the bile is increased and is absorbed into the system so that jaundice sometimes results. Apoplexy results from the congestion of blood in the brain. In repeated indulgences the effects are cumulative and induce loss of appetite, indigestion, and affections of the brain. The logical hygienic conclusions from these facts are that one must avoid all strong emotions and intense pleasures; and meet the sorrows and agonies of life with philosophical resignation and equanimity. In such conditions work and occupation to employ and divert the mind and to render one proof against the temptations of idleness is one of the greatest blessings of life.

A Stock of Energy.—We are often struck by the wonderful display of physical and nervous energy by persons of fragile appearance at critical times. The storing up of nerve force and of supplies to withstand sudden and severe demands is well provided for in the physical economy. Nature always looks ahead in the most prudent way. She stores her surplus force in reservoirs all over the body in varied forms to guard against both the irregular supply of food and unexpected drafts upon her resources. If this were not so, man could not go, as he often does, for long periods without food or sleep. He lives during such periods upon the stock of energy which Nature has laid up for him. Especially is this remarkable in the case of brain work. The worker may arouse himself with stimulants at such times, but he only drugs the guards of pain, hunger, anxiety, and weariness which warn him of approaching exhaustion and fatigue. Physical and nervous collapse come on him unawares and almost before he knows it he is in the clutches of nervous prostration. This violation of a very simple

principle is so often seen among good business men who would smile at the statement of so self-evident a fact that it is impossible to maintain a bank balance by continually writing checks and never making a deposit. Yet such is the unreasonable and erroneous attitude which many of these assume towards the highly necessary physical and nervous stock of energy.

DOMESTIC HYGIENE.

R. W. CONANT, A.B., M.D.

Among the physical needs of man, a healthful and convenient dwelling place stands next in importance to food and clothing. The first essentials of a dwelling should be plenty of pure air and sunlight. Neither appearance, convenience, nor expense should be allowed to interfere with these essentials, and yet they often do.

Location.—This problem is much simpler in the country than in the city. The more thickly people dwell together, the more difficult it becomes to secure plenty of air and sunlight, to say nothing of freedom from dust, noise, and smells. In the city it is a great temptation to sacrifice these good things to considerations of accessibility, cheapness, or mere gregariousness. The very poor, especially, manifest an almost invincible propensity to crowd into the slums, where they pay as much for one or two noisome rooms in a tumble-down rookery on a filthy street as it would cost to rent a pretty little cottage in a suburb, with plenty of air, sunshine, and outlook. This soul and body destroying choice they persist in making, in the face of all advice, partly from ignorance and prejudice, mainly from the herding-together instinct, stronger even than in animals. And so the slums spread and fester like great plague-spots in the large cities—hotbeds of crime, misery, and infant mortality.

Even in the better residence districts of a large city the conditions are none too good, especially for children. Where house is joined to house in solid rows, there is necessarily much room space which can never receive direct ventilation and sunshine. Worst of all, these dark rooms are usually the bedrooms, which most of all need abundant sun and air. So long as people will persist in packing into these unhygienic and often unsanitary dwellings, the only thing which can be advised is to make the best of a bad case. This will be considered in detail under the subject of "Ventilation."

The Suburbs.—If possible, own your own home, with a bit of ground

for a garden. In any case, live where there is open ground all around the house, so that no room shall be destitute of direct access to light and air. If you are obliged to rent, have a separate house or cottage if possible. It is only a question of going out far enough, and if you are near good, rapid transportation, you are really as near to business as there is any need of being. On the lines of railway radiating from all our cities there are beautiful, healthful suburbs which can be reached in from twenty to forty minutes; and what are a few minutes more in transit compared with the advantage of exchanging the noise and filth of the city every evening for the beautiful, peaceful country, especially in summer? It is a strange perversion of taste which prefers staring solid blocks of houses and hot pavements to trees and lawns.

Flats vs. Houses.—Much can be said in favor of each. Other things being equal, flats are usually cheaper, and if on the first or second floor, they save much stair-climbing—an important consideration for women or invalids. But the better air, view, and more sunshine are usually found on the top floors. On the other hand, they are poor places for rearing children, for reasons too obvious to need enumerating. But if a flat is to be rented, it should be one which has a maximum of wide courts, with good-sized rooms, well cleaned halls and alley, with prompt and sanitary disposal of ashes and garbage. Of course the plumbing, drainage, ventilation, heating, thickness of the walls and floors, woodwork, and cellar should be carefully inspected. It is also well to make some judicious inquiries of the tenants and neighbors. Especially critical should the inspection be if the building stands on "made land." Find out whether the land was "made" of garbage and refuse or of good soil.

Skin Flats.—In some localities there has been a great deal of real estate speculation in "skin" flats and apartment buildings. A "skin" building is one which is put up as cheaply as possible, with a view to filling it with tenants and then selling quickly at a big profit before the building falls down. The judicious renter will be on the lookout for this class of flats and houses. Sometimes they are quite difficult of detection, the skimping and falsifying being confined to the parts of the buildings which are out of sight; but usually such buildings have a family resemblance instantly recognizable by the experienced renter. Almost always they present a tawdry prettiness, an excess of cheap colored glass and imitation woodwork, calculated to catch the eye of those who choose a dwelling place because of such adornments.

The Best Way.—But by all odds the best way, when it is possible,

is to decide first on your location and the rent you can afford to pay. Then watch the flats and houses being built in that locality, so that you may get an intimate knowledge of their construction, which will be impossible after they are finished. In fact, that is the only way in which you can be sure that any dwelling has a real drainpipe, actually connecting with the sewer through a perfectly sealed trap, and with ventilation to the roof. And yet that one thing is essential to the healthfulness of your home. Always rent a new flat, if possible, so as not to inherit other people's dirt or bugs.

Of course you select your location with due regard to your family needs. If you are a business man, transportation must be reasonably quick, prompt, frequent, well lighted and heated; the station within easy walking distance, over good sidewalks, well lighted. If you have children of school age, a good school must be reasonably accessible. Fire and police protection must be adequate, which includes a fire plug and alarm box near your house, and a street which an engine can get through in any weather. You should investigate the range of prices at the neighboring groceries and markets, to learn if they are exorbitant; also prices of gas, coal, and wood. If your wife must have domestic help, of course the matter of the local supply of assistants must be inquired into.

The necessity of these precautions seems quite self-evident, and yet it is the neglect of them which often entails months of annoyance and loss, perhaps sickness and death. Either you or your wife must look after these things; don't take the agent's word for it. He is there to rent the property and get his commission. Likewise, do not accept any verbal promises of changes or repairs to be made on the premises—have everything of any importance put in the lease. That document, by the way, should be read very carefully before you sign it. Some of them are tricky and outrageously unfair.

The Country House.—Much of what has been said above applies equally to the choice of a house in the country, especially as regards sunshine and air. But there are other features that are decidedly different. While you could scarcely avoid plenty of sun and air if you tried, you must plan very wisely for good water and effective drainage. If you are so fortunate as to be able to build your own house, there is no end of conveniences for you to plan.

Of course the first thing is the selection of the site. The ideal site will be on ground somewhat elevated, in order to secure perfect drainage and wide view, but that may not be possible. If obliged to build

on the flat prairie, do not dig for a cellar more than three feet at most, and take every precaution to make it dry.

Soil.—You cannot pay enough attention to the soil upon which the house is built. Most people think that if they avoid a marsh that they have a dry soil. Others are deceived by a sandy soil, and tell you that sand is one of the best drainage soils to be found. Yes; provided it is deep enough. But a foot or two of sand on a clay or rock base through which the water cannot drain is the most dangerous of all. If you are unfortunate enough to live on a damp soil, you would better move; for here is a list of the diseases which are connected with a cold or damp soil: all catarrhal affections of the lungs; rheumatism; neuralgia; consumption; malarial fevers; typhoid; cholera; diphtheria; diarrhœa; and dysentery.

If you have selected a site on the side of a hill, do not dig your cellar out so as to leave a cliff behind and the ground sloping to the front. But build a terrace in front so that you will have the same depth of earth all around the house.

Dry the soil out as much as possible by effective drains. Put a cement floor over the bottom of the cellar, except where the drainpipes run. Put a board covering over the latter flush with the floor, so that you can get at them when necessary without tearing up the cement. See that no foul matter drains down from around the house; some people drain the surrounding land through their cellars. The effect of that is obviously bad. These points properly carried out will give you a dry cellar; one that can withstand perfectly the rainy or spring season.

The Cellar Walls should be double to promote dryness. This may be accomplished in various ways—by building the cellar walls with hollow tiles, perforated brick, or artificial stone. The latter is especially good, since the internal cavities are so large that they connect freely; for the same reason, a house built entirely of artificial stone is best protected against both cold and dampness. Of course the cavities should connect with the cellar and also with the open air at the roof, so that the heat of the furnace shall cause a free circulation of warm air throughout the walls. That will both dry and warm the house.

On the outside the earth should be well banked up against the cellar walls at least two feet high, and to the same height the outside surface of the wall should be so well coated with tar, asphalt, or Portland cement as to be wholly impervious to water. Cellar windows should be put in with hinges and bolts so as to be opened easily for ventilation in dry

weather. Nothing should be kept there which moulds or makes a musty smell.

The House Walls may be of wood, brick or stone, natural or artificial. Wood is usually the cheapest material, the coldest in winter and the hottest in summer. But whatever the material is, one thing is of prime importance—plenty of free air space all around the house between walls and plastering—and this space should communicate freely with the cellar. A furnace in the cellar, as usually managed, is one of the most wasteful ways of heating a house, for the reason that half of the heat is retained in the cellar, which becomes the warmest part. By making house walls practically double and connecting the middle space freely with the cellar, this wasted heat will circulate throughout the walls and add greatly to their warmth.

The Roof.—Of course the roof should be water-tight—the object of a roof is to keep out moisture. There are several advantages of the sloping roof compared with the flat. Rain and snow run off rapidly, and the sun's heat in summer strikes only half the roof at a time except at midday. By opening the attic windows a circulation of air is secured which relieves the excessive heat of the upper rooms, and by closing them in bad weather an ideal playroom is secured for the children. Also a large attic is a very convenient dry storeroom, or it may be partitioned off for extra rooms if needed later.

Water Near the House is to be avoided. Stagnant water should never be allowed in any form or under any excuse. The chief objection is that stagnant water is the breeding place of mosquitoes and other insects, and mosquitoes are not only an intolerable nuisance, but also the conveyors of dangerous disease germs.

The disposal of drainage and sewage is the most difficult problem of all, especially if the ground is flat. One thing is sure, it must not be allowed to collect in pools of any kind to decompose into noxious gases, unless you want sickness in your home. Neither should it be run into the streams, making open sewers of them.

Sewage.—The method adopted must depend a good deal upon circumstances. If you have land under cultivation, all sewage should in some way be conveyed upon that land to act as a fertilizer, and especially all human excreta. The old-fashioned privy, as usually found in the country, is an abomination from every point of view and smell. By exercising a little intelligent care all that refuse, mixed promptly with clear soil, can be converted into a valuable fertilizer instead of a nuisance.

But in winter the privy should be put out of commission entirely, and the earth house closet substituted. That will save a good deal of pneumonia and rheumatism.

Dry Earth Closet.—This is an application of the principle that the earth is the natural deodorizer of decomposing organic matter, to which class the human excrement belongs. If dry earth be added to manure it immediately becomes inoffensive. There are special forms of dry earth closet manufactured for sale. But where the use of them is necessary, a little care and ingenuity can make the necessary simple arrangement to apply one or two essentials. The earth must be dry, for the value of it depends upon its absorbent power, and wet earth has already absorbed about all that it can contain. Either dry clay or dry garden loam answers best. Sand is of no use whatever, as it is quartz, and that is not absorbent. The second essential is that a sufficient quantity of this good, dry earth be applied immediately after every use of the closet. No water or liquid must be poured into the receptacle, as this will make it offensive. The smaller the receptacle the better, as that will necessitate more frequent removal of the contents. For the destruction of any germs that may be in the fæcal matter, a small quantity of quicklime will prove effective in a few minutes. The great difficulty in carrying out this principle is to get the right kind of earth and to dry it.

Rain Water from the roof should not be allowed to run into the ground near the house, nor should it be allowed to stand even a few hours in any receptacle which can be entered by insects for the purpose of depositing their eggs. Looking out for this will save you much trouble later. Kitchen slops should not be thrown out to draw flies, but should go to fertilize the garden. By all means have a garden—two of them, vegetable and flower, one for you to dig and hoe in, and the other for your wife and children to raise beautiful flowers in.

The Rubbish Pile.—Paper and all refuse which will burn should be so disposed of regularly in some remote corner, out of sight if possible. To the same rubbish pile should be conveyed all the ashes and litter of every kind, and the duty of keeping the premises thoroughly "picked up" is easy work for the children. It should not be made a task, but a matter of pride with them; it should be understood to be their department, and any spending money they are to receive should depend upon the efficiency which they show in that department. In this way ideas of industry, orderliness, of earning what they get, and of appreciating the value of money will be inculcated effectively from the start.

Water Supply.—Next to the importance of getting all tainted water out of the house is the importance of bringing none in. This is almost as difficult, and is a point frequently overlooked. How many families take all their drinking water from a well in the center of a filthy barnyard, toward which the ground slopes from all sides!

Generally speaking, the best water supply is a driven well of at least one hundred feet. But even that must be considered carefully with reference to the geological dip, for water will travel a long way underground between strata. Therefore, the well, however deep, should be located as far as possible from any privy, drain, sewer or barnyard, and should be on the "up" side of it.

If the supply is taken from a spring, lake or river, that and all its tributaries and surroundings should be inspected with great care to make sure that there is no possibility of contamination by organic matter. If there is reason to doubt the purity of the drinking water, or if any epidemic breaks out in that neighborhood, see to it promptly that all the water drunk in your house is boiled half an hour and then allowed to drip through a gravity stone filter. After filtering, the water may be sealed up in Mason jars and set in the ice box to cool. That is not as poetic as the old oaken bucket that hung in the well, but it will cost less in doctor's bills.

The dweller in the country has this great advantage over city people, that he can investigate and choose the source of his water supply. Although vast sums are spent on waterworks by all great cities, it is notorious that their supply is impure, often dangerously so. But the city dweller also holds his health in his own hands, for it is always within his power to boil the water and then filter it. Of the many filters on the market the simplest of all and also the most effective consists of two earthen jars, of which the upper one has a porous stone bottom through which the boiled water filters drop by drop. No family should be without one, for the germs of typhoid, cholera, and dysentery find an entrance into the body through impure water.

The Grounds about the house should be judiciously variegated with trees and shrubbery. But neither should be allowed so near the house as to promote dampness or shut out sunshine and air. The house should have one or more wide verandas, screened in summer; and with movable roofs which can be taken off in winter to let in the sunlight freely. Both city and country dwellings should face south, if possible, for that throws the kitchen, which needs the sun least, to the north side. For a like

reason it is highly objectionable to have the kitchen on the west side of the house, for in summer the afternoon sun, added to the heat of the kitchen stove, makes the room a very inferno in which the suffering wife or domestic must prepare the evening meal.

If there are any natural woods on your grounds, it is well to consider them in selecting the site. If the house is situated in the right direction from the woods, it will be protected from the worst blasts of winter; while in summer you will get the music of the leaves and the sweet scents of the forest.

The Interior.—Even more than the exterior of the house, the interior will be affected by considerations of expense, individual taste and special uses. But certain general principles may be laid down which should apply to all. Rooms should be large, light, and cheery, especially bedrooms. There is a too prevalent notion that the parlor must be a handsome room, while any dark closet will do for a bedroom. If possible, every room should have two windows and on opposite sides, and a large closet. The minimum size of a room should be 1,000 cubic feet, say 12 x 9 x 9.

Windows should be large, and both sashes easily moved, so that the upper may be lowered in warm weather to let out the hot air. Consequently the wire screens should be full length. Of course every door should be screened, with a spring to keep the screen door always closed. Every outside door should have a chain bolt, for safety at night and by day when the men are away. The front door should either be all plate glass, or should contain a glass window through which the person outside can be seen plainly. An electric light just outside the door, which can be turned on before opening, is also an excellent arrangement. A small wicket in the outer door, for speaking without opening, is wise.

Stairways and Halls.—These should be wide, of easy tread, and as straight as can be. There should be two stairways at least, front and back. In the country, where land is comparatively cheap, no dwelling ought to be more than two stories high, for there is scarcely anything more injurious to women than frequent stair-climbing. For the same reason let there be an abundance of electric bells and speaking tubes and a dumb waiter.

The Roof Garden.—The stairways to the attic and roof should be as easy as any in the house, not like ladders, as is usually the case. On the roof, even if it is a sloping roof, it is an excellent idea to have a platform to which the family can bring easy chairs and sit under an

awning by day, or under the stars by night, whenever the weather is exceptionally sultry. That is about the only thing to be said in favor of a flat roof, that it can be turned into a veritable roof garden, far above heat, dust, noise, miasms, and insects; on a hot night when bedrooms are ovens, the roof will permit of refreshing, healthful slumber. The roof is appreciated by Orientals but neglected by Occidentals.

Every Room in the house should be bright and cheery, no dark holes or catch-alls. If you have a flat roof and no attic, set aside one large, bright room as a storeroom for everything not in use which is worth saving.

Don't concentrate all your efforts on beautifying the entrance and parlor at the expense of everything else. Let every room be good enough for the neighbors to see, and no room too good for the family to use. Of course all bedsteads and springs should be of metal throughout. Your domestic's room should be as pretty and attractive as your own, and she should be required to keep it just as neat. That is one of the secrets of inducing a domestic to stay with you, which is peculiarly difficult in the country.

Hard Oiled Floors. If possible, have hardwood floors throughout the house, and never allow a carpet in your home, for both sanitary and financial reasons.

House Cleaning.—This bugbear of housekeeping is immensely simplified by having no carpets to pull up and tack down. All that is necessary is to have all the rugs taken well away from the house to be beaten and swept, while the hardwood floors are gone over with a weak solution of green oil soap. First, however, the furniture should be cleaned with a brush, and the curtains taken down if it is time to have them laundered. Plush covered furniture and unnecessary draperies are highly objectionable on account of the dust which they hold.

Painted walls are easiest cleaned, and are especially suitable therefore for the bath room and kitchen. Good paper on walls can be cleaned, but it is a tedious and not altogether satisfactory process; the best way is to repaper after stripping off the old. Calcimining cannot be cleaned, but must be done over. Tapestried walls offer the advantage of being easily cleaned, but of course they collect dust very quickly. Simplest and most sanitary of all is wood or metal paneling or enameled brick, which can be gone over easily and quickly with a damp cloth; or with an antiseptic, if there has been any contagious disease in the house.

Prevention of Dust.—It is astonishing how much dust and fuzz will

accumulate in a house even in a single day. Much of it is unavoidable, but much can be avoided. Clothing worn in the street is brushed in the house, if brushed at all. This practice is both filthy and dangerous. Of course all outer garments should be thoroughly shaken and brushed outside the house every time they have been worn outdoors; otherwise they soon become perfect nests of every breed of germ life.

Another prolific source of dust is the hot air pipes. They should be taken down every fall and cleaned.

The Playhouse.—The best way to prevent dust in a house where there are children is to give them an entirely separate playroom. If your means and grounds will permit, build a playhouse for them in the yard, where they may be turned loose in bad weather with perfect safety, and allowed to raise all the noise and dust they want to. In pleasant weather the same little house may supply a welcome retreat from interruption to an adult who wishes to read, write, or smoke.

The Kitchen.—In these days of improvements the kitchen should be a veritable workshop of labor-saving devices, each in its place. Foremost of all, there should be a substitute for the coal range for summer use; the best is a gas range. If you cannot get gas, have one of the best gasoline cook stoves. The latter are made now so as to be perfectly safe and very convenient. Over either should be an ample hood connecting with the chimney, to carry off the odors of cooking.

Then there is the ice box or refrigerator, which may be in the kitchen, or better, just outside, to escape the heat of the stove. There is much to be said in favor of each. But if there is much milk, cream, and butter to be cared for, neither should be used; instead there should be a dairy with running water in which everything of the kind can stand. A small imitation of this can be obtained by taking an ice box large enough to hold two or three hundredweight of ice, and plugging the outlet with a large spool. This will keep a few inches of ice water continually in the box, in which jars of milk and cream may stand. The ice should rest on crates, which will keep it out of the water. The ice box or refrigerator should be scrubbed thoroughly with hot water, or boiling water and borax, and then allowed to air for half an hour, every time new ice is to be put in.

Cleanliness.—Of course the kitchen should be spotlessly clean. As little grease as possible should be allowed to run down the sink drain, which should be flushed frequently with hot lye water. All bread, cake, and other food not in the ice box should be kept in close tin boxes out of reach of flies, ants, roaches, and mice.

The Bath Room should be the best ventilated and best heated room in the house. All the plumbing should be open; a porcelain-lined iron tub of good length is the best and most durable. Have no wooden rim around it, and have it well tipped toward the outlet. Clean it with gasoline.

Enameled brick in colors is the most sanitary, the handsomest, and most expensive covering for the floor, and for the walls to a height of at least five feet. If they are too expensive, substitute some hard finish which will wash, as cement or paint, and wash it frequently. All the outlet pipes in the bath room or elsewhere should be flushed with a solution of copper sulphate, mercuric chloride, or some other good disinfectant, at least once a month; in hot weather oftener.

Every waste pipe in the bath room, and throughout the house, should be well trapped; and, so far as possible, all traps should be easily accessible and detachable for cleaning purposes. Not only should plumbing be open, but pipes of all kinds in the walls should not be plastered over but inclosed in channels with covers screwed on, permitting inspection and repair without damage to the surrounding walls, floors, etc.

Usually the bath room is the coldest room in the house, being inconveniently located at the end of some hall. That is a great mistake. In cold weather it should be so well warmed that those of low vitality can strip for a bath without danger of a chill. That will save sickness and promote cleanliness at the same time. Of course there should be every convenience in the bath room, including sprinkler and rough towels which will really scratch—no imitation.

Ventilation.—The breathing of impure air, especially that which is deficient in oxygen, involves a rapid deterioration of the blood, the red corpuscles being impoverished, and the life current loaded with poisonous matter which should be eliminated promptly. Therefore thorough ventilation, particularly in cold weather, is a matter of prime importance. Evidently, also, it is closely connected with the problem of heating.

It would seem superfluous, in these times of general education, to urge the importance of ventilation, and yet how often the newspapers record deaths by asphyxiation during sleep. Either the gas jet goes out or the damper in the stovepipe is shut, and then the bedroom fills with gas because all windows are shut tight. Such deaths would be impossible if people ventilated their sleeping rooms at night as good health demands.

This lack of ventilation is the chief cause of that much dreaded

disease, consumption, which is responsible for one-seventh of all deaths by disease. Consumption is almost wholly an impure air disease. If it has not reached a too advanced stage, it can always be cured by sleeping in the open air.

Impurities of Air.—When a tightly closed room of ordinary size has been occupied for any length of time the air becomes loaded with impurities, partly from bodily exhalation and partly from the heat and the artificial light, besides the dust which may be stirred up by moving about. Of these impurities the most objectionable is carbon dioxide, a product of combustion, whether through the lungs, the pores, or the stove. It is not directly poisonous, for three to five hundredths of one per cent of outdoor air is usually carbon dioxide; but in a close and occupied room this small amount is rapidly increased, taking the place of the vital oxygen and so becoming highly injurious. Inasmuch as oxygen is the only part of the air which we really use in respiration, as it is absolutely and continually essential to life, and as it constitutes only one-fifth of the volume of the purest air, it is evident that it takes very little impurity to impair the air seriously for breathing purposes.

Tests.—There are several ways of proving chemically the presence of carbon dioxide, but it is hardly worth while to bother with them. You know well enough, without chemical test to prove it, that the air of a tightly closed and occupied room is sure to be foul. The nose test is ordinarily sufficient, for anyone of fairly good nasal perceptions, coming into such a room from outdoors, will immediately detect the impurity of the inside air. Yet people will crowd into theaters, concert halls, and other public rooms, where the air is, to a person of fine perceptions, simply horrible. And there they will sit from one to three hours, breathing each other's breath and exhalations!

The Problem of ventilating a public hall properly is extremely complex and expensive, but in the home there is no excuse for having bad air. The ideal method is to have some device for drawing off the impure air as fast as fresh warm air is introduced, or of introducing fresh cold air gradually from outdoors. There are several such methods which can be built into the house at the beginning. For ordinary purposes, however, the natural leakage of air around windows and doors in very cold weather will be sufficient to keep the air of a house healthfully pure. As soon, however, as it gets milder outside, or as soon as a single room is shut off from the rest of the house, or as soon as an extra number of people are assembled in the house, it will become necessary to renew the

air more rapidly. The difficulty is to do this without causing draughts, which are extremely dangerous to people who are sitting still. One of the best and simplest ways to raise the window a few inches and insert a board below, which shall exactly fill the space through which the sash has been raised. This will allow fresh air to work in gradually between the upper and lower sashes. At night the whole house, and particularly the bedrooms, should be well ventilated. If every bedroom door has either a transom or a chain-bolt, this can be done without danger of being surprised by burglars.

Carbon Monoxide.—In all the above it is assumed that the heating apparatus is properly constructed and managed, so that it shall not add any carbon monoxide to the other impurities of the inside air. This chemical compound is a product of imperfect combustion, and is deadly poison. It is likely to be present whenever stoves or furnaces are improperly fired, or when gas or oil stoves are burned in the room without a chimney to carry off the products of combustion. The latter, at the best, eat the oxygen out of the air at an alarming rate.

Moisture is another troublesome constituent of air. If there is too little, the air passages become dry and subject to catarrh; if there is too much, the necessary exhalation through the pores is retarded. Modern dwellings are apt to err on the side of being too hot and dry. Dryness of the air in a room is easily remedied by setting a pan of water in a warm place, and all good furnaces have a receptacle for that purpose, which should be kept full.

Heating.—It is hardly worth while to discuss the old-fashioned method of heating by stoves—the objectionable features are so evident that stoves have, for the most part, long since been discarded in favor of furnaces of various kinds. Wherever they are still in use, however, great care must be exercised to prevent any chance of their pouring forth the deadly carbon monoxide, especially at night when the family is asleep. The only thing to be said in their favor is that little of the heat produced is lost.

Furnaces, on the other hand, are usually wasteful because a large part of their heat is radiated into the cellar, which is the warmest part of the house. This can be obviated considerably by having the furnace and warm air pipes thickly covered with asbestos to check radiation; also by having the cellar connect freely with the air space between double walls all around the house—as explained under "Construction." Also, furnaces make a good deal of dust, which flies up the flues unless care is taken to open the dust damper before shaking down.

The furnace may be used—with a hot fire and all the drafts open—as a crematory for garbage which cannot be disposed of otherwise.

Of course the same loss of heat occurs in furnaces which heat boilers for hot water or steam heating, but they have the advantage of not carrying dust directly into the rooms. On the other hand, they lack the advantage of introducing warm air fresh from outdoors, as the warm air furnace does; and it takes longer to get up steam or hot water than warm air, which is a consideration in bitter cold mornings. Besides that, unless you have a double system of steam pipes, to bring and carry off steam, you are likely to be annoyed by cold radiators and by the banging of the steam in the pipes. Hot water heat is more quickly obtained but less intense.

These objections may be overcome by having the steam radiators in the cellar instead of in each room, and passing air over and through them directly from outdoors, and then through pipes to each room. Sometimes the air is strained of dust by being passed through coarse cloth. This combination of steam and warm air is frequently used in large buildings, and has the advantages of both systems, of both direct and indirect radiation. But any system of heating should be combined with a system of effective ventilation, to carry off the impure air.

Whatever method of heating is employed, it will be found that in time the heat will shrink the woodwork badly, unless the latter had been very thoroughly seasoned before building. So far as possible, the cracks and crevices thus formed should be filled up, either with putty or cement or slivers of wood; otherwise they become permanent dust holes and germ nests.

Start Early.—But whatever the mode of heating there should be no neglect of one thing. In cold weather it should be the duty of some one who is reliable to start the furnace so early that the house will be comfortably warm when it is time for the family to rise. Much sickness, discomfort, and lying abed are due to the foolish practice of having an ice cold house just at the time when warmth is most needed. If the dampers are so arranged as to be worked by chains from the first or second floor, it is a slight matter for some one to attend to them very early and then go back to bed for another nap.

Fireplaces and Grates.—The first is the real thing, the second is only a feeble imitation. Still, a grate full of glowing coals on a cold night is much better than a blank wall. Both, however, are sanitary and æsthetic, rather than practical heating devices. What can be finer when

the wind is howling outside like a banshee, and the snow drifting against the windows, than to sit snug before a roaring fireplace, either in solitary meditation, or with the family grouped around, looking for pictures in the glowing embers? Of course the fireplace is the most wasteful method of all for heating a room, but its advantages quite justify the extravagance for those who can afford it.

Regulation of Temperature.—Few people can agree exactly as to the most desirable indoor temperature in winter. In the first place, a temperature which seems just right to a person sitting still and working with his brain seems suffocating to one who is moving about and doing manual work. Seventy degrees Fahrenheit is generally the lowest which the former can bear without risk, and that does not mean 70 degrees at his head but at his feet. People differ also in respect to vitality, either from difference in age or constitution, and what is just right for one is just wrong for another. Therefore no rule can be laid down except the very general one, that the temperature of the house should be kept as low as the members of the family can stand it without taking cold. If there is anyone in the house who, for any reason, must have a higher temperature, that person should have a warm room shut off from the rest.

The temperature of the house should not be continually fluctuating between hot and cold, according as some one impulsively booms the furnace or throws open a window. Individual feelings are a poor guide. The temperature should be kept as near as possible to some fixed point on the thermometer—usually 70 degrees is best—by some one whose regular duty it shall be to attend to it.

Automatic Regulation.—Better still is it to have automatic regulators such as are installed now in many schools, hotels, and some private houses. These work by electric contact, so that when the temperature reaches the degree for which the regulator has been set, the heat supply for that room is diminished automatically until the temperature falls below that point.

In hot weather the opposite problem needs to be solved. It is not very creditable to our inventive geniuses that they have not yet devised any practical method of cooling houses cheaply in summer. Some day, doubtless, it will be done. It would not seem that the difficulties were insurmountable in the way of passing ice cold water through the pipes and radiators through which steam is forced in winter. Even now that is done in larger cooling plants, but for private dwellings the expense is prohibitive.

As matters stand now, little can be done toward cooling the interior of most private houses besides keeping the windows down. The senseless modern custom, especially in cities, of building houses with no protection from the glare of the midsummer sun beyond a scant roller shade, leaves the inhabitants at the mercy of the heat. But there is an excellent device in an outside shutter which is so hinged that it can be opened either sideways in the usual manner or vertically, *i. e.*, open at the bottom with a hinge at the top. In the latter position it is equivalent to an awning, only better, for the slats may be opened for either view or breeze.

If the heat becomes dangerously intense, resort to the Hindu device of wringing out towels and sheets in cold water and hanging them in the windows and doorways. The evaporation will lower the stifling temperature a little when a little means a good deal.

Lighting.—The best light is that from the sun, which tries the eyes least and is deadly to all disease germs. Therefore every building and dwelling should have a maximum of window surface, especially in the city; and, when possible, two windows opposite each other in each room. Neither should these be rendered valueless by piling shades, curtains, and draperies over them, as is sometimes done to the extent of three layers. The sunlight should enter every room in the house which it can reach, and the bedrooms especially should be thrown open to it at the right time every day.

But modern life peculiarly requires artificial light, and many are so unfortunate as to be obliged to use it all day at their work. Of all the artificial kinds the worst is the arc light, with its intense white glare and frequent jumping.

A good kerosene lamp with round or duplex wick and well cared for gives the mellowest and cheapest light. If the oil is bought in five gallon lots or by the barrel the cost per hour is a small fraction of a cent. Lamps, however, give out a great deal of heat, and are therefore unsuitable for warm weather.

Gas is good or bad, according as it is used. In the first place, it is the easiest thing in the world to run up enormous gas bills, especially in a large house where several people are careless about allowing it to burn. But if each room is provided with a "by-pass" on the gas fixture, and if each person will be careful to pull the by-pass as soon as the light is no longer needed, the bills can be kept within bounds. There are two places, at least, where a light should burn low all night—the hall and the bath room.

The ordinary gas jet is wasteful, heating, insanitary, and unclean. A large part of the gas is not consumed at all, but is deposited as soot on the ceiling, or floats in the air until deposited elsewhere. Not only is the oxygen burned out of the air rapidly, but also the air is filled with impurities, so that the effect is soon apparent to the senses, and later appears in drowsiness and headache.

Incandescent Gas Light.—But great improvements have been made in gas lighting, especially by the use of mantles and various forms of the Bunsen burner. These devices are now brought to such a point of perfection that a beautiful, steady light, flooding the room with a mellow radiance, may be obtained from a jet of gas so fine that it issues through a mere pinhole. Of course every part of it is consumed. The by-pass can be attached to these also, so that the mere pulling of a small chain shuts the light almost off or turns it on full strength. This variety of gas light is extremely cheap and satisfactory. The only objection which can be urged against it is that it heats up the room in warm weather.

The Incandescent Electric.—One argument in favor of the electric bulb is that it does not heat the air appreciably and does not vitiate it. Also, the light is easily turned on and off, and on an insulated wire cord the bulb may be hung anywhere in the room. It is still the most expensive light, but it is being cheapened and perfected all the time. One of the latest improvements has obviated a decided objection—that there was no choice between darkness and brilliant illumination. Now the "Hylo" device enables one, by a turn of the wrist, to reduce the light to a one candle power. The so-called 16 candle power bulb is usually a third less, so that several are needed to make a good reading light. Defective insulation and crossing of wires have been the cause of many destructive fires.

Acetylene Light.—This is familiar to the public in the form of the acetylene bicycle lamp. The light is intensely brilliant, casting very black shadows, with great evolution of heat. The chief point in its favor is that it is one of the cheapest illuminants, but there is a public prejudice against using it on account of its bad record of explosions. The manufacturers insist, however, that they have now brought it to such a point of perfection that it is absolutely safe.

Gasoline Generators.—The most familiar form of these are the flare lights suspended over hucksters' stalls, but the evolution of heat by the blue hydrogen flame is out of all proportion to the light. This may be obviated by using gasoline with an incandescent mantle, as is done

in street lamps where gas is not obtainable. The light thus produced is very bright, about the same as from the best gas mantles. Of course gasoline must always be handled with care, and never exposed in the same room with a light or fire of any kind.

For household use it is better not to depend on any one illuminant exclusively, lest it may fail unexpectedly and leave you in the dark.

Position of Light.—Inasmuch as artificial light must be used largely, it is of the highest importance that the light should be so placed as to have the least injurious effect on the eyes. This may be accomplished in different ways, and each has its merits. In case the light is strong and brilliant, as incandescent gas or electricity, it should be up near the ceiling, and the direct rays should be softened by ground glass or porcelain globes. Then the room will be filled with a diffused radiance much like sunshine.

But even this may be trying to weak eyes, in which case a feebler light should be used, set on a table near the book or work and covered with an opaque reflector which will throw all the light on a circumscribed area, leaving the rest of the room in dim light.

If a lamp is used it should be well shaded, or else the reader's sight should be protected by an eye shade or by turning his back to the light. The latter is preferable, when possible, for the reason that it compels him to hold up his head and receive the light over one shoulder. Children, especially, are prone to hang over their books, which interferes with the free circulation of blood through the neck and brain, and, worst of all, congests the eyes. The eyesight of school children in general grows alarmingly worse, and every care should be taken to prevent any congestion or strain in that part.

EFFECTS OF CLIMATE ON HEALTH.

The functions of the liver and of the skin are particularly active in warm climates; the digestive processes are not vigorous; in the dry season the nervous system is excited, and in the wet season, depressed. In cold climates the digestion is vigorous; the nervous system sluggish; the muscular development is great, and life is generally more prolonged than in any other climate. Temperate climates, on the whole, are most healthful; there is no strain on the liver, the digestive organs, or the skin, as is seen in warm climates; nor upon the lungs and kidneys, as

is the case in cold and damp climates. The cool, temperate climates are the most healthful of all.

Acclimatization.—This is the process by which man adapts himself to new climatic conditions. He undergoes certain changes by which he can thrive and maintain health in a climate to which he is not indigenous. The great reason why inhabitants of a colder clime who move to the tropics suffer so severely is because they are not so careful of their health as are the natives. It does not appear clearly proven that one can become so adapted to a climate as to become immune to disease. There is no length of residence that will prevent one from taking malaria in regions where that poison exists. Even the natives cannot successfully withstand it. While the natives of the tropics are able to bear the intense heat of the sun to an almost incredible degree, a stranger can never, even after years of residence, become inured to its effects. Much of the unhealthful state of tropical regions is due more to a lack of sanitary conditions than from the effects of the climate proper.

Diseases Due to Climate.—There are certain diseases which may be justly regarded as climatic. Malaria, yellow fever, inflammation of the liver, and dysentery certainly may be so considered. Pulmonary affections, such as bronchitis, pneumonia, consumption, are unknown in some regions and are very prevalent in the temperate climates. Sunstroke and frostbite are, of course, due to exposure to the extremes of temperature. Generally it may be said that the majority of the infectious diseases, such as cholera, yellow fever, etc., are to be found most frequently in hot climates; malaria and its chain of attendant diseases are due to a poisonous soil. Liver troubles, dysentery, and certain forms of anæmia are characteristically tropical diseases, while lung affections are most frequent in damp climates.

BOOK II.

THE CAUSATION AND PREVENTION OF DISEASE.

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It might be supposed, on first thought, that the "Preservation of Health" and the "Prevention of Disease" are synonymous terms; but a glance at the topics which are discussed in this and the preceding articles is the surest and speediest means of realizing that, while they are intimately connected in results, they are widely different in methods. They are co-equal divisions of the great branch of Hygiene. In the one case we conform to those rules of hygiene by which the body and the mind are brought into a more vigorous state of health; in the other case we endeavor to ascertain the causes of disease and to remove or overcome them.

It is now proposed to gather up the different conditions and causes which bring about disease, and to consider how they may be successfully attacked in our daily living.

Causation of Disease in General.—The two great classes into which the causes of disease are divided are: the predisposing causes and the exciting causes. By predisposing causes to disease are meant all of those conditions which so change the state of health of a person as to make him subject to, or predisposed to, contract a certain disease to the influence of which he happens at that particular time to be exposed. The exciting causes to disease are those which immediately excite or impart a disease. Suppose, for illustration, that twenty people are breathing the same air, which is laden, as nearly all air is, more or less, with germs of disease. One of the number is stricken with disease and the other nineteen are not at all infected. It is ascertained on inquiry that the one who contracts the disease has been suffering severe privation of food and clothing. This privation has so deranged the health and weakened the vitality, that the system became a suitable soil, as it were, for the growth of the disease as soon as its germs were implanted therein. The privation endured is clearly the predisposing cause; and the germs are the exciting cause. Those who were not affected, although they had breathed these same germs of disease at the same time, had by regular

living and observation of the laws of hygiene so fortified themselves against the attacks that there were no predisposing causes to the disease. There are some families that are remarkable for "catching" all the diseases to which they are exposed. The predisposing causes to disease, as hereinafter considered in detail, are the points for such to consider, for along those lines lie their avenues of escape. One of the most marked peculiarities of predisposition to disease is the fact that a number of persons in the same place, at the same time, and under exactly the same conditions, may be exposed to the effect of cold, to the extent of contracting a chill. Now, so far as the immediate effect of the cold is concerned, it acts on all of them alike. That is, it chills the surface of the body, the pores of the skin contract and close up, and internal congestion takes place. But some of the number experience no ill effects, one of them is attacked by bronchitis, another with pneumonia, another with inflammation of the bowels, and a fourth with apoplexy. Those who were not affected were not predisposed to disease. The others were attacked according to the part of the body that was most affected by the congestion. To more clearly understand these and similar instances, it is necessary to take up the predisposing causes in detail.

Predisposing Causes to Disease.—The chief of these are: age, sex, heredity, hygienic conditions, and climate.

Age.—The influence of age is very considerable. Childhood and youth, being the period of growth and excessive repair, and old age, the period of decay and excessive waste, are the stages of life most susceptible to disease. Maturity, or middle life, the period of equality of waste and repair, is comparatively free from disease. Then, the diseases of childhood are very different from those which affect declining years. The first and second teething periods and puberty are the critical times of childhood and youth. Among the diseases of these periods are acute catarrhal inflammation, especially of the alimentary tract, convulsions, acute tuberculosis, rickets, measles, scarlatina, whooping cough. To these may be added those diseases resulting from unsanitary conditions of living, such as overcrowding, bad water and air, privation, etc., contracted chiefly because their powers of resistance are very low at this age. At puberty the mental, moral, and physical conditions are easily disturbed and hysteria, epilepsy, lung affections, chorea, or St. Vitus's dance, and rheumatic and scrofulous diseases are common. Adults rarely suffer from the diseases peculiar to childhood, because the attack in their earlier years renders them insusceptible, more or less, in later years.

Practically the only diseases to which persons of mature age may be said to be liable are those of occupation.

During decline, those diseases which are dependent upon the degeneration of tissues are common. It is difficult to say, however, when old age sets in, for many a man at forty is older than another at sixty, so far as decline and waste are concerned. Characteristic diseases of this period are: diseases of large organs, loss of power of the stomach, liver, kidneys, and degeneration of the brain, nervous system, and its functions.

Sex.—Apart from those diseases which are obviously peculiar to the sexes, it is a matter of observation and record that women are more subject to hysteria and allied diseases, ulceration of the stomach, neuralgia, and goitre, than are men; and that men are more susceptible to epilepsy, tetanus or lockjaw, gout, diabetes, locomotor ataxia, vesical or bladder trouble, and acute affections of the lungs.

Heredity.—Heredity, as a predisposing cause of disease, manifests itself in the variations of robustness, or of constitutional strength to resist unfavorable influences. It is usually observable as a family trait, although a marked difference in these respects may be noticeable between the children, according as this one favors the father and that one the mother. It is in this connection that family history plays such an important part in matters of hygiene. It must be remembered that a sound constitution does not mean great physical size and muscular strength. We often find under the "goodly outside" a weak constitution, ill-fitted to withstand the attacks of disease; and, on the other hand, in those of delicate, clear skin and slender build, are frequently stored up veritable surprises of large vitality and abundant force to cope with disease.

Very erroneous ideas prevail concerning the transmission of disease from parent to children. It was, until very recently, firmly believed that if one of the parents died from consumption, cancer, or a similar disease, the children were marked, and that the same fate awaited them in spite of all that could be done for them. In the reaction that has set in against that belief, there are some extremists who quite as firmly believe that heredity has absolutely nothing of influence in these matters. The safe and sane belief is that if a parent has been afflicted in that way, the children, while carrying no actual taint of the disease, are predisposed to the disease and that it is necessary that they especially observe a careful mode of life in order to fortify themselves in that particular direction. It is not only arrant folly but positively suicidal for a man or woman to allow the knowledge of the existence of such so-called hereditary diseases

in the family to cause the relinquishing of hope, or of interest in life. There are some who are haunted by such knowledge, and who seem to be standing on the brink of the grave, in momentary expectation of the appearance of the well-studied symptoms. Many a life has been destroyed by such anticipation. Every pain or slight ache is construed by them as being the manifestation of the long-expected infirmity, and they thus drag out a life devoid of pleasure or of purpose. It is not necessary for such persons to go beyond the facts and figures of insurance companies for assurance. It is clearly proved by years of record that of those persons who have been refused as being unsatisfactory risks on account of the death of one or both parents by such diseases, not ten per cent are ever affected by them. Those are cold figures, made without favor or prejudice, and as such should be clear and convincing proof that their fears are groundless. A rigid observance of the laws of health will remove them beyond the influence of these predisposing causes.

Hygienic Conditions.—Insanitary conditions of living are the direct cause of many persons, otherwise well started in life, acquiring a marked predisposition to disease. Among these conditions are overcrowding, privation, and fatigue, which, unfortunately, too often are the ills borne by the poorer classes. Overcrowding, with its lack of fresh air, and its poor ventilation to remove the foul air, works out its slow poisonous effects upon the body. Privation lowers the strength and tone of the system. Fatigue wastes the tissues beyond the bodily power of repair and is a constant drain upon the vitality. Intemperance in food and in the use of alcohol are not only in themselves predisposing but exciting causes to disease. Impure drinking water leads to a special predisposition to diarrhœa, cholera, and fevers. Insufficient clothing exposes to the chill and so predisposes to that exciting cause of so many ills. Occupation, whether by overcrowding in ill-ventilated workrooms or by the breathing of irritant gases, is often both a predisposing and exciting cause of lung and other affections. Climate, with all of its variations and extremes, is both predisposing and exciting.

Exciting Causes of Disease.—The exciting causes to disease are divided into four classes: mechanical, physical, chemical, and vital. They admit also of a broad division into external and internal causes.

Mechanical Causes.—These produce results that chiefly concern the surgeon. Among them are external violence, which produces bruises, cuts, wounds, fractures, shock, and mutilation. The internal exciting

causes to disease include the stopping of passages by gallstones, by stone in the bladder, by abscess, inflammation, and by foreign growth. These, perhaps, may be considered as lying beyond the domain of hygiene, as they are usually the result of morbid conditions.

Physical Exciting Causes.—These include extremes of heat and cold, which produce respectively sunstroke and frostbite; but they do not include climatic effect of the more moderate temperatures.

Chemical Exciting Causes.—Under this head are grouped the poisons, whether the mineral and vegetable poisons introduced into the body, or the internal poisons which form in the body. There are also snakebite, alcohol, putrid and decayed food poisons, commonly known as ptomaines, all of which may be regarded as being introduced into the body, and come under the head of the external poisons. In addition there is the poisoning by accumulations of effete matter in the system. The commonest of these is the poisoning by the absorption of fæcal matter, which is the great ill effect of constipation, and the absorption of uric acid from the kidneys causing rheumatism and uræmia. Uncleanliness of the skin prevents the elimination of matter by that channel, and the consequent driving back of these poisons into the system.

Vital Exciting Causes.—Among these are the parasites that cause parasitic diseases, contagia of other specific diseases, and malarial poison. They are known as vital causes because most of these media for conveying disease are living forms; the very great probability is that all are.

Contagion.—The distinction which was formerly made between contagion and infection is responsible for many erroneous notions as to the way in which dangerous diseases are communicated. It was held that contagious diseases could be contracted only by actual touching of the person affected; and that infectious diseases were communicated without actual contact. This distinction lost sight of the carrying power of clothing and other similar means of conveying disease. In this way much greater risk of exposure to disease was taken and the spread of disease increased.

Contagion is properly the property or the process by which disease is communicated from one part of a diseased body to another part of the same or to another body. The Latin name of *contagium* (plural *contagia*) has been given to whatever does this. The means of contagion is contact; and this contact may be immediate, by actual touch, or it may be by mediate contact, as through clothing, discharges from the body or by germs of disease.

Nature of the Contagia.—Modern scientific research is tending to show with more and more certainty that all contagia of disease must contain in itself, or be included in, some form of living organism capable of multiplying itself rapidly. This is the basis of the germ theory of disease, and the living forms go by the name of micro-organisms, or generally of bacteria. Very valuable contributions to this phase of the spread of disease have been made by Koch, the German scientist. He has laid down the following conditions as being necessary to demonstrate that a particular form of micro-organism is beyond doubt the cause of a certain disease:—

1. The organism must be found in the tissues or fluids of the person suffering from the disease.

2. It must be taken from the body and recognized with absolute certainty by a series of experiments and examination by cultivation.

3. It must be injected by inoculation into the bodies of animals to clearly prove that it is capable of producing the same disease in them.

4. The organisms must be proved to be present in the last named case as laid down in the first condition mentioned.

Mace, the scientist, suggests that two more conditions be laid down as necessary to indisputable proof, viz.:—

5. That the organism be not found in other diseased conditions.

6. That the organism be not one of the known harmless forms which are found in the skin and the intestines both in health and disease.

These conditions have been met in so many diseases that the theory is accepted as true in all cases, and additional research is constantly contributing more proof. The facts regarding the nature of the contagia, so far as known, may be briefly laid down in the following points, to be borne in mind:—

The contagium of any one specific disease, on entering the system, produces that disease and none other; the virus of diphtheria produces diphtheria and not smallpox.

When the contagium has entered the body it multiplies in the body indefinitely.

Bacteria.—The bacteria which produce disease are divided into two classes: first, those which live on dead animal or vegetable matter, which cause decay or fermentation, and are not able to enter the tissues of living plants or animals, and are called *Saprophytes;* second, those which live within or upon the tissues of living plants and animals, some without harmful effects, and others producing disease. These are called *Parasites.*

The great group of bacteria is divided, on the basis of their shape, into two large families. The first family includes all those which are spherical, cube-shaped, united in chains, and those which occur in irregular masses. To this family the name of *Coccaceae* is given. The second family includes those which are in the form of rods or cylinders, and grouped into genera according as the rods are straight or nearly so, curved or spiral of several turns, those with a gelatine covering, and those which are long and thread-like.

Cholera.—The bacterium which produces cholera (*Spirillum cholerae*) is commonly known by the name of the "comma bacillus," as it resembles the comma in shape.

Diphtheria.—It is generally conceded that the germ which produces diphtheria is the *Bacillus diphtheriae,* although several forms of bacteria are found in the false membrane in the throat.

Mode of Entrance into the Body.—The poison of disease enters the body in one of the following four ways:—

1. By coming in contact with the broken surface of the skin or mucous membrane.
2. By coming in contact with the unbroken surface of the skin or mucous membrane.
3. By inhalation of the air.
4. By food and water taken in the acts of eating and drinking.

Action within the Body.—Immediately after the poison has entered the body, there follows a period of longer or shorter duration during which the poison is inactive. This is known as the period of incubation, when the symptoms of the disease develop. Then follows the period of invasion, during which the symptoms manifest themselves. The period of eruption comes next, and lastly the period of decline.

The period of incubation varies greatly, not only in different diseases but in different cases of the same disease. It may vary from not less than a month or even a year, as in the case of hydrophobia, to a very few hours.

During the periods of invasion and eruption, the poison is diffused throughout the organs of the whole body; the lymphatic glands throw the poison into the blood in constitutional diseases and into the organs in local diseases, and the contagium multiplies itself to an enormous degree.

In the stage of decline of the disease, or recovery, there are indications that the poison has run itself out, either by reason of there being no more material favorable to its growth upon which it may act, or by

the formation of chemical substances in the body which prevent it from doing so; or because the stamina, or resisting power of the body, has been great enough to overcome the attacks of the poison. The effect, generally, of an attack of a disease is to render the person immune to future attacks of the same disease.

Exit from the Body.—During the course of a disease, the contagium has increased and is present in the body in enormous quantities. Its mode of exit largely depends upon the part affected. In typhoid and cholera, where the seat of the disease is the intestine, the contagium is voided in the stool and urine. In smallpox, the seat of the disease is in the pustules on the surface of the body, so the poison passes off in the scales of skin and matter which falls from the body of the patient. In scarlatina, the passage is in the same way as in smallpox, and the process of peeling of the skin is known as desquamation. Contagious throat and lung diseases void the poison in the discharges of sputum and phlegm.

Existence Outside of the Body.—The behavior of the poison on reaching the outer air is very different in different diseases. Some of the poison, as that of typhus, loses its power of infection in the presence of air; probably the oxygen of the air destroys it. The poison of other diseases, such as smallpox and scarlatina, lives for a long time, is carried about in clothing, and remains in a dormant condition for a long period, ready to break out into virulent activity as soon as the conditions of its development are favorable. This difference of behavior of the poisons of different diseases is of the utmost importance to remember in the prevention of disease.

Modes of Transmission.—If the poison has been passed from the body in the fæces, it is most likely that these will eventually contaminate the water supply or food supply, and thus food and water become one of the most frequent modes of transmission of such poison. Other poisons which pass off into the air are inhaled. So that the most common means of transmitting disease is by water, food, and the air.

GENERAL RULES FOR THE PREVENTION OF INFECTIOUS DISEASES.

1. Place the patient as far as possible away from the other members of the family. If it is possible, give him the top floor and keep that for him and his attendant exclusively. If the home does not afford this accommodation with comfort, remove the patient to a hospital. This

is a duty to the other members of the family and also to the public health. No sentimental or other feelings should be permitted to interfere with this plain and clear duty to the family and the patient, as well as to the community.

2. Those who nurse the patient must be persons who have already had the disease, if such can be procured. They should remain with the patient and not come in contact with the other members of the family. Should they do so they should first wash in water in which some disinfectant has been placed, such as carbolic soap or Condy's Fluid. They must avoid breathing the patient's breath. Nurses must have exercise in the open air regularly, first washing and changing the clothing. The latter should be of cotton, which does not afford a lodging place for germs and contagion, as do woolen materials.

3. Keep visitors out of the rooms. Those that are admitted should conform to the sections of the second rule applying to nurses.

4. The contents of wardrobes, closets, etc., in the sick room must be removed at the time of occupancy. No bed hangings, lace curtains, carpets or rugs, and similar lodging places for poisons and infection should be permitted to remain in the room. Only such furniture as is absolutely necessary, and that is very little, should be retained.

5. Ventilate the room by partly open windows, by opening the chimney draft, and, in cold weather, by keeping a grate fire going, if possible, even though the house is otherwise heated. The open fire is the best ventilator in the house.

6. Keep the door closed, and hang over it a sheet dipped frequently in a disinfectant solution such as Condy's Fluid, chloride of lime, carbolic acid, or corrosive sublimate.

7. All the discharges from the patient, the sputum, vomit, fæces, and urine, should be received in a disinfected vessel, and another quantity of the disinfectant be added to the vessel before carrying the contents to be emptied into the closet, or to be burned or buried.

8. All pieces of cotton or linen used for wiping the nose or mouth, or for receiving the sputum, should be at once burned. They must not be allowed to accumulate or lie around.

9. When the sheets or the sleeping garments of the patient are changed, each article, before being taken from the room, should be dipped in a disinfecting solution; let them remain in this for an hour and then boil them at once.

10. Keep the patient and his bed scrupulously clean.

11. Let the patient have one set of dishes, spoons, and drinking glasses, for his exclusive use. See that his dishes are used only by himself and not by others, and that he does not use the dishes of others. All dishes used by the patient should be placed in a disinfecting solution before removal from the room, and then washed in boiling water.

12. All scraps, and unfinished or untasted food, should be treated in the same manner as are the discharges from his body—disinfected and thrown at once into the sewer, burned, or deeply buried. No other member of the family should eat them.

13. After recovery, the bedding, the clothes of the patient and all of the furniture and entire contents of the room are to be instantly and thoroughly disinfected by the methods and according to the directions given on page 163.

SPECIAL PREVENTIVE MEASURES FOR INFECTIOUS DISEASES.

Smallpox.—Isolate the patient. Smear the surface of the skin with oil, vaseline, or glycerine, slightly carbolized, to prevent the infectious matter of the disease from diffusing into the air and so spreading. Receive the discharges from the body in disinfected vessels. Burn the cloths used on nose and mouth. Disinfect the bedding, clothing, and furniture. Vaccination is the great preventive.

Chicken Pox.—No preventive means are needed, as the disease is a mild one, always resulting in recovery.

Measles.—Isolate the patient. Smear the skin with oil, vaseline, or glycerine, as advised in smallpox. Disinfect discharges from the body. Burn rags used as handkerchiefs and napkins. Disinfection of clothing, bedding, and furniture, generally neglected, under the impression that the disease is not serious, ought to be done very thoroughly.

German Measles (*Rubella*).—No preventive measures are needed, as the disease is a mild one.

Scarlet Fever.—Isolate the patient. Promote the shedding of the skin (desquamation), by which the infection is dispersed, by sponging the body twice daily with tepid water to which a small quantity of Condy's Fluid is added, and by applying carbolated oil or cream of carbolic acid (1 in 40). After the fever is over, wash with flesh brush and carbolic soap, and apply the carbolic cream or oil (1 in 20). Dress the hair with carbolic oil. Syringe the throat and nose with a very weak solution of

Condy's Fluid or other antiseptic wash. Disinfect the clothing, bedding, and furniture. Boil all milk used by the family during an epidemic of this disease.

Typhus.—The most preventable of all diseases; but the means must be seriously applied and persistently carried out. Danger of contagion is great only near the body of the patient, as the contagium soon dies in the air. Isolate. Ventilate thoroughly, even to the extent of outdoor tent treatment of the patient. Free use of disinfectants about the room. Exclusion of visitors and thorough disinfection of clothing, bedding, and furniture. Ventilation is a powerful prophylactic.

Influenza, or Epidemic Catarrh.—The general mildness of the disease does not call for further isolation than the avoidance of mingling in gatherings of people. The sputum, of course, should be disinfected and destroyed.

Whooping Cough.—Isolation. Disinfection of the discharges from the throat and lungs. Freshening the air by sprays of disinfectant. Disinfection of clothing, bedding, and furniture.

Mumps.—Isolation and hygienic means. Not sufficiently serious to call for stringent means.

Diphtheria.—Isolation, which must be kept up as long as the presence of infectious matter is found in the throat. Sometimes this remains for a very long time after the membrane has disappeared. Three weeks after the disease has gone is the minimum period of isolation. Expectoration, throat and mouth and nose discharges, are to be received in a disinfected vessel and treated with a further application of the disinfectant before destroying. Rags are to be burned, and clothing, bedding, and furniture must be thoroughly disinfected. No disease calls for more stringent disinfection. The general rules must be thoroughly enforced and observed.

For prevention, all dampness and accumulations of dirt must be removed. Careful inquiry must be made of other children in the family as to the condition of the throat. Schools ought to be closed during an outbreak of diphtheria; at all events, teachers should make frequent and regular inquiry among the children for the appearance of sore throat.

Typhoid Fever.—Disinfection of the stools in a 1 in 20 solution of carbolic acid or in a 1 in 1,000 solution of perchloride of mercury; add a further quantity of the disinfecting fluid to the vessel before carrying it out. Keep the vessel covered. If the drainage of the premises is not efficient, so that the matter will be thoroughly removed, it is safer to

burn it. All of this care must be paid to the discharge because it is the principal medium through which the disease is conveyed. Disinfection of the clothing, bedding, furniture, etc. Strict isolation is not imperative.

Yellow Fever.—The general measures for the prevention of an attack necessitate the recollection that yellow fever is born in filth. Good sewerage, in order that all excreta may be carried off safely, free ventilation, no overcrowding, cleanliness, and pure water, are essential. After the disease has broken out, isolation; disinfection of vomit and stools, with a 1 in 1,000 perchloride of mercury solution, or a 1 in 20 carbolic acid solution; ventilate the room well, screen the windows to keep out flies and mosquitoes, and thoroughly disinfect clothing, bedding, and furniture.

Cholera.—This is another disease that cannot thrive in clean and sanitary surroundings. Isolation, rigid attention to the disinfection of all discharges, which must be received in a vessel containing from 6 to 8 ounces of a disinfecting solution; add the same quantity before removing from the room. All discharges should be buried.

Dysentery.—Avoid exposure and malnutrition, drink only good water, and breathe only pure air. Disinfect all discharges, treating them with a 1 in 20 carbolic solution or a 1 in 1,000 perchloride of mercury solution.

Malarial Fevers.—Among the predisposing causes of these diseases are fatigue, a depressed condition of the body, lack of nourishment, a chill, the fact that one has previously had an attack of the fever, and recent arrival in a malarial district.

The exciting cause is a micro-organism known to scientists by the name of *Plasmodium malariae*. It is found in the blood of sufferers from this disease. The disease is communicated by the poison entering the body through the bite of certain mosquitoes, by drinking water, and possibly by inhalation. While it is not contagious, it is more than likely that it is transferred from one to another by the mosquito. So far as is known, that is the only way in which the poison leaves the body.

After the plasmodium has entered the body, efforts must be directed toward preventing its multiplication. This is done by 5 to 10 grain doses of quinine. All malarial patients should be protected by mosquito netting to prevent the mosquitoes from transferring the poison to healthy persons by inoculation. To prevent the larvæ of the plasmodium from breeding or hatching, it has been suggested that the marshes and pools

be drained, or the pools filled up with earth. The fact that a pool on the Gold Coast of Africa near the petroleum wells contained no mosquitoes, and consequently no malaria, led to experiments by which it was found that the use of one ounce of kerosene to every ten feet of surface of the breeding pools of mosquitoes in malarial districts will prevent the disease. The adequate protection from mosquitoes by window and door screens is a sure preventive.

Erysipelas.—Predisposing causes are the existence of a wound, disease of the bowels, poor food, intemperate habits, and having suffered from the disease before. The exciting cause is a micro-organism known as *Micrococcus pyogenes*. It enters the body through a broken surface or through an intact mucous membrane. The poison is carried through the air exclusively. The preventive measures are good hygiene, food, ventilation, and cleanliness, and antiseptic treatment of wounds.

Septicaemia or Blood Poisoning.—This is a similar disease to erysipelas, and requires the same precautions and preventive measures. It is caused by bacteria known as *Micrococcus pyogenes aureus* and *Micrococcus pyogenes albus* and *Micrococcus pyogenes citreus*. In addition to these are the *Streptococcus pyogenes* of erysipelas. The disease is very generally propagated by soiled instruments, sponges, fingers, linen, clothing, etc. In addition to the precautions suggested as preventive of erysipelas, there are some special antiseptic measures to be adopted in childbirth, when this disease so frequently occurs. The antiseptics recommended comprise washings of perchloride of mercury 1 in 1,000, carbolized oil 1 in 8, and Condy's Fluid. These are for use by nurse, medical attendant, and for washing the patient. Sponges, instruments, bedpans, and everything of that nature which may come in contact with the patient are to be so treated. Soiled linen and bedding must be at once removed from the room.

Tetanus or Lockjaw.—This is caused by the *Bacillus tetani* entering the body through a broken skin. It is widely distributed in the soil, street dust, and floor sweepings. The preventive measures are clean linens, and the precaution that no dirt or dust reach a wound. The dirt on rusty nails and under the finger nails are direct sources of these germs.

Tubercle.—See article on Phthisis or Consumption, page 165.

Hydrophobia or Rabies.—The poison enters the body directly by inoculation by a bite. The incubation period is never less than a month and sometimes as long as a year. The efficacy of the Pasteur protective inoculation cannot be doubted. In the past history of this disease the

mortality was 100 per cent. No cures were known. The actual number of persons who develop rabies after a bite by a rabid animal is not known, but the percentage of deaths among those bitten is over 20 per cent. Out of over 1,500 cases treated in one year in the Pasteur Institute there were only three deaths.

DISINFECTION.

There must be no halfway measures in disinfection, for disinfection means, in the newer application of the word, the actual destruction of every particle of poison given off by a patient during illness from an infectious disease. This work must be regularly and persistently done. It is not sufficient to do it in five cases and omit doing it in the sixth. It is not enough to remove the discharges from a typhoid patient and to throw them out so that they will linger in the soil and find their way into water, where they will multiply and be ready to attack and to spread the disease. That is only temporizing with disease. If proper precautions were always taken by those in charge of patients, there would be no such thing as epidemics. There will be a few isolated cases just so long as people do not observe hygienic laws of living and use ordinary protection against disease. One single neglected discharge from the body of a typhoid case may be the means of creating an epidemic.

Disinfectants are physical and chemical. The chief physical disinfectants are: fresh air, sunlight, heat, moist heat, dry heat, boiling, and sterilization.

Fresh Air.—The antiseptic action of fresh air is due partly to the union of its oxygen with decaying matter upon which the bacteria thrive and in which they multiply. This union of oxygen with other matter is known as the process of oxidation. It has the effect of breaking up the noxious matter into other harmless substances and of forming with them compounds of oxygen that are not favorable to the increase of the bacteria. So that, while it does not absolutely kill the germs, it suspends animation and restrains growth. The effects of sunlight are very much the same, so that these two great purifiers of the air are not to be considered as germicides nor as substitutes for disinfectants. They are not sufficient in themselves to prevent the spread of disease, but are supplemental to the action of true disinfectants and germicides.

Heat.—The vegetative forms of most bacteria are killed by a temperature of 140° Fahrenheit. But destruction of the vegetative form does not effect perfect disinfection. For many of the bacteria increase

by means of parts known as spores, which act as seeds or eggs. If these spores are not destroyed along with the parent forms, they will grow and increase. A heat of 180° Fahrenheit is needed to kill them, which it will be remembered is within 32° of the boiling point. As moist heat in the form of hot water or of steam is a more destructive means of killing bacteria and their spores than is dry heat of a higher temperature, it will be seen that boiling water is a sure agency to use in killing these forms of contagia. But it is found that simply to pour boiling water upon them is not sufficient; it is necessary to expose them to its action for a length of time varying with the species. Consequently it is necessary to cover the vessel in which they are being treated for an hour or two before throwing them out. If treated for too short a time they will revive again under favorable conditions. Ineffective means of disinfecting are worse than none.

Not only is a sufficient length of exposure to the disinfecting agent necessary, but care must be taken that every part of the matter which is under treatment must be exposed to the action of the disinfectant. In no other way can one be sure that all of the contagia are destroyed. The survival of even one of the bacteria is full of tremendous possibilities in the way of a future epidemic. Boiling is therefore one of the most effective means of sterilizing, as this method and its effects are called. All clothing, bedding, and similar articles that can be boiled for an hour will be thoroughly sterilized or disinfected. While it is found that in some cases a lower temperature than the boiling point and a shorter period of treatment will accomplish the purpose sought, it is better to err on the right side than to find out too late that the process has not been effective.

Sterilization and Pasteurization of Milk.—There are four diseases, typhoid, scarlatina, diphtheria, and tuberculosis, in the spread of which it is tolerably certain that milk plays an important part. While the extent and the manner in which diseases are spread by milk are more or less open questions, frequently debated, the known facts are such as to warrant the employment of preventive measures by all who use milk. It has been shown in the preceding paragraph that boiling is a most effective method of killing disease germs. We accordingly apply that treatment to water which is suspected of containing impurities. It would be the safest course to boil milk. But when milk is boiled it undergoes certain changes not only in taste and smell, but in the digestibility of the casein, the condition of the fat and the coagulation of the albumen which

injure it as a food. Therefore the process of sterilization stops just short of the boiling point. It is found that an exposure to a temperature of from 150° to 160° degrees Fahrenheit for half an hour will kill all of the disease germs found in it except that which is supposed to be responsible for infantile diarrhœa.

There are many sterilizers expressly made for this purpose and they are all fairly effective. The ordinary method of caring for milk in this way is both effective and easily applied in any household. The milk is best placed in a glass bottle, the mouth of which is loosely plugged with absorbent cotton, which permits the entrance of air but filters it in its passage. The bottle is placed in a pan of water on the stove and carefully watched so that it does not boil or become too hot. As the matter is one of experience, it is safer at first to watch the heat of the water in the outer vessel for a time with a thermometer, so that one will be able to successfully gauge the temperature by the judgment alone. The milk is stirred or shaken from time to time to insure all of the contents of the bottle being equally heated, and to prevent the cream from coming to the top on cooling. It is important that the milk be quickly cooled at the close of the process. The advantage of pasteurized milk over untreated milk is that 99 per cent of all the disease germs which it contains are destroyed, the exception being the germ of cholera infantum; and its advantages over boiled milk are, that it is more digestible and more palatable while its condition as a food is unchanged.

The difference between sterilized and pasteurized milk is that sterilized milk may be boiled milk but pasteurized milk never is.

CHEMICAL DISINFECTANTS.

Out of the great mass of chemical disinfectants which have come forward during recent years, it is necessary to mention only a few. These are the disinfectants which have under all circumstances met the requirements of quick action, efficiency, and ease of application.

Corrosive Sublimate.—This is the common name given to the perchloride of mercury. In a 1 in 1,000 solution, it kills the germs of typhoid, diphtheria, and erysipelas in eight seconds; and the spores of the bacilli of these diseases in a few minutes. It has two important disadvantages for general use: it is expensive and it is poisonous. In a colorless solution of the latter, the danger is increased, consequently it is often colored, so that a solution of it will not be mistaken for water.

To make a solution of corrosive sublimate of the strength of 1 in 1,000, it is necessary to take—

Corrosive Sublimate,.....½ ounce.
Hydrochloric Acid,.....1 ounce.
Water, ...3 gallons.

If this proportion is observed, the proper strength will be secured. For convenience the disinfectant is also sold in tablet form, which enables one to make a solution of the requisite strength, in any quantity, with ease and certainty.

While corrosive sublimate is a powerful disinfectant and germicide, it is to be noted that it does not destroy the tubercle bacilli in the sputum of consumptives. This is explained by the fact that it coagulates the exterior of the sputum so that it cannot affect the inner parts of it, and so cannot reach the tubercle. This, so far as is known, is its only limitation.

Carbolic Acid.—In the proportion of 3 per cent, carbolic acid kills the germs of typhoid, diphtheria, and erysipelas in eight seconds, but the spores withstand even a 5 per cent solution for several days. It therefore is inferior to the corrosive sublimate as a spore killer, and consequently as a germicide. But a 5 per cent solution of carbolic acid will kill the tubercle bacilli in thirty seconds and the spores of it in one hour. Its prompt and effective action on germs, and its ease of application, make it a good antiseptic.

Formalin.—This is the vapor formaldehyde dissolved to the extent of 35 to 40 per cent in water. Neither the vapor, formaldehyde, nor the solution of it, formalin, is poisonous, although both have a very pungent and irritating odor. In both of these forms it is a very powerful disinfectant. It kills, in the form of a 3 per cent solution of formalin, all forms of disease germs in from one to fifteen minutes. Even in the weak preparation of 1 in 10,000 parts, formalin prevents the growth of cholera, typhoid, and diphtheria germs.

The ordinary strength of formalin is obtained by dissolving or mixing four ounces of formalin in one gallon of water, to which is added five ounces of glycerine, which has the effect of preventing change in the solution and also causes it to dry more slowly.

Formaldehyde.—The gaseous form of formalin is regarded as one of the most effective gaseous disinfectants in use. It is little likely to damage objects upon which other and more powerful disinfectants have an injurious effect.

Chlorine.—This gas is one of the best disinfectants in use. It does its work much better in the presence of dampness than in dry atmospheres. The change which it brings about in objectionable and unhealthy matter is a real chemical change; it has such an ease of union with the gas hydrogen, which is present in all vegetable and animal matter, that it unites very quickly with it. In this union it breaks up the matter which originally contained the hydrogen and forms entirely new and harmless compounds with it.

It is liberated when water is poured upon chloride of lime. The amount liberated by the action of water is comparatively small and slow. But if hydrochloric acid be poured on the chloride of lime, the supply is greatly increased. The gas also bleaches and destroys foul odors. Three pounds of chloride of lime and three pounds of commercial hydrochloric acid for every 1,000 cubic feet of space will kill all of the disease germs in eight hours. The walls and ceiling should be moistened to get the best results, and the vessels in which the generation of the chlorine gas is being conducted should be placed high, as chlorine gas is heavier than the air and therefore sinks toward the floor.

Sulphurous Acid.—This is a gas that is given off when sulphur is burned in the air. It has had for a long time a great household reputation as a strong and efficient disinfectant; and it seems hardly possible that germs of disease can withstand the powerful pungency of its fumes. But recent experiments have served to show that its value for this purpose is overestimated. It appears that the slightest covering is a sufficient protection for germs against its effects. Its efficacy is greatest in the presence of moisture, and it is employed in the proportion of three pounds of roll sulphur to every 1,000 cubic feet of space acted upon.

Quicklime.—This is a powerful germicide, and a 1-10 per cent solution of it will kill typhoid and cholera germs in five hours. It is also used to disinfect damp places and dry or earth closets.

Permanganate of Potash.—While this is a good disinfectant and a valuable antiseptic and deodorant, it is useless in practice, as its force is expended in attacking the organic matter in which germs are found. So much of its energy is used in this direction that enormous quantities would be required to accomplish the desired end.

It must be conceded that corrosive sublimate and carbolic acid are by far the best agents known to science for disinfection and germicide uses.

PRACTICAL DISINFECTION.

One of the first subjects in the practical disinfection in the sick room during infectious disease is the disinfection of the discharges from the body. It is in these that a great danger of the spread of the disease lurks, and prompt and persistent efforts must be made in this direction. In considering the special diseases in a previous section, reference was made to the special means of accomplishing this object in particular cases. These directions may now be summed up.

The fæcal and urinary discharges must be received into a bedpan, or other vessel, in which are placed from six to eight ounces, about half a pint, of either corrosive sublimate solution, 1 in 1,000, or a carbolic acid solution, 1 in 20. The corrosive sublimate solution of the required strength may be made by taking—

Corrosive Sublimate,.....½ ounce.
Hydrochloric Acid,.....1 ounce.
Water, ...3 gallons.

The carbolic acid solution of this strength, 1 in 20, is made by taking—

Carbolic Acid,.....8 ounces.
Water, ...2½ gallons.

Immediately after the discharge is received into the vessel, a further quantity of the disinfecting fluid is to be poured in. If the discharges are fluid and copious, this after addition must be very liberal.

The diseases to which this procedure especially applies are: typhoid fever, cholera, dysentery, consumption of the bowels, and yellow fever. In any of these diseases the vomit is to be treated in the same way.

Discharges from the Mouth and Nose.—These discharges are to be received either into vessels, as in the previous mentioned cases, and treated in the same way, or are to be collected in rags used as handkerchiefs or napkins, and afterward burned. The diseases in which this is to be done with special care are: diphtheria, whooping cough, scarlet fever, smallpox, measles, and consumption. In the latter case, the sputa will best be treated with a solution of carbolic acid, 1 in 20. In scarlet fever and diphtheria it is well also to spray the throat with some disinfectant.

Discharges Through the Skin.—Smallpox, measles, and scarlet fever are the chief diseases in which the poison of the disease leaves the

patient's body through the skin. It is in the crusts of the pustules of smallpox, in the scales of skin (the epithelia) of measles, and the peeling skin of scarlet fever that the poison abounds; and by it the infection is spread as it passes into the air. It is well on this account to apply oil, vaseline, glycerine, either plain or carbolized, to the skin, with a view to preventing these particles from floating promiscuously through the air. By confining them to some such agent as an oil they are retained until removed by the bath. The bath should for this reason be of a mild disinfecting nature, and the water of the bath after bathing should be disinfected with the carbolic or corrosive sublimate solution.

Typhus fever discharges the contagia of that disease through the pores of the skin. This contagium loses much of its infectious power when reaching the air. Therefore free ventilation is necessary to carry off this infectious exhalation from the body. By passing out of the room into the larger space of the air its power is greatly weakened by dilution, and the danger of infection by it is destroyed. While confined to the small space of the sick room, it is concentrated and therefore virulent and dangerous. The greatest danger from infection in typhus and relapsing fevers lies close to the body of the patient.

Disinfection of Clothing and Bedding.—The systematic and really efficacious method of disinfecting very large and bulky articles is by means of moist or dry heat, and as the apparatus for this purpose is out of reach of houses and homes generally, other means must be employed which, if not so good, are the best obtainable. Such clothing and articles of bedding as blankets, sheets, pillowcases, and all washable articles as can be soaked or boiled, can be thoroughly disinfected. There are several good solutions which will do this work perfectly. A carbolic acid 5 per cent solution is the 1 in 20 solution previously mentioned on page 163. A chloride of zinc, 1 in 240, or chloride of lime solution of two ounces to the gallon, or the corrosive sublimate, 1 in 1,000 solution, will answer admirably. The articles must be soaked for from twelve to twenty-four hours, after which they are to be boiled and washed.

Disinfection of Rooms and Furniture.—A room cannot be disinfected and occupied at the same time, for the process renders the air entirely unfit for breathing. All articles that can be otherwise treated as before mentioned are of course removed. Closets are opened so as to get full effects of the disinfectant. The windows, doors, and all other openings are to be closed. The room is then to be fumigated for three hours with either chloride of lime, formaldehyde or sulphurous acid.

The proper quantities and proportions of these are given on page 162. After the fumigation has lasted for three hours, the doors and windows are opened to insure thorough ventilation for from twenty-four to thirty-six hours. If the house is otherwise occupied, it will be impossible to have the doors communicating with the living apartments open. But all other possible means of ventilation must be made use of. Those who are employing the disinfecting means must be careful not to expose themselves to the fumes, for there is great danger of being overcome by them. The paint and woodwork must now be scrubbed thoroughly with a 1 in 1,000 corrosive sublimate solution, or with soft soap, or with both. If the walls are papered, all of the paper, including every layer of paper, must be taken off, and the walls washed with hot lime before being repapered. The ceiling is also washed with the same. The wooden furniture is to be washed with a 1 in 20 carbolic acid solution or the formalin spray of 1 in 40, or the 1 in 1,000 corrosive sublimate solution. It is of infinitely greater importance that the walls, ceiling, and woodwork of a room, and the articles of furniture in it, receive a thorough treatment than that the air of the room alone be so treated, for the air in the room may be easily changed and a fresh supply procured. The other parts of the room afford lurking and hiding places for the germs, and the room is unsafe for occupancy until these have been thoroughly disinfected.

MODERN METHODS OF PREVENTING AND CURING CONSUMPTION.

The message which Robert Koch, a physician in an obscure German village, gave to the world in 1882, is by far the most valuable contribution to the public welfare that has been made in modern times. In this message he announced that consumption is spread like other contagious diseases; that this greatest of all scourges can be prevented; and, most important of all, that those who are afflicted by this "great white plague" may be cured if they take the necessary precautions in time. The direct result of Koch's discoveries is that the work of stamping out this frightful menace to public and personal health and life is placed, not upon the physicians of the country, but upon every individual in the community. As it is upon the intelligent and united action of every man, woman, and child in this country that the prevention and cure of consumption depend

there is no hope that this result can be achieved, even in a slight degree, unless the means and the principles of their application are thoroughly understood.

Ravages of Consumption.—It is the most widespread of all diseases. Every nation in the world suffers from it. Every year, in the United States, a part of the population equal to the entire population of a city the size of Indianapolis, Kansas City, St. Paul, or Rochester, N. Y., dies from it. That means 160,000 persons a year, or about 438 every day in the year. Every hour, in this country, eighteen persons die from the effects of a disease which can be prevented. The public is appalled by the death of four or five hundred persons in a burning theater, or on a burning steamer, or in a great earthquake. But every day an equal or greater loss of life occurs, in isolated cases, with an awful train of sorrow and suffering, to say nothing of commercial and economic loss.

We have learned to look upon diphtheria, scarlet fever, and cholera as diseases which cause a great many deaths. Yet all of the deaths from cholera, diseases of the bowels, diphtheria, scarlet fever, and measles, combined, do not equal one-half the deaths from consumption. Generally speaking, one out of every ten inhabitants dies of consumption; in cities, one out of every seven. Out of all of the deaths of persons between the ages of fifteen and twenty-four years, consumption kills one out of four; between twenty-five and thirty-four, one out of three; between thirty-five and forty-four, one out of four. Pneumonia is the only disease that approaches consumption in point of fatality.

What Consumption is Now Known to Be.—Consumption is a contagious or infectious disease. Koch demonstrated conclusively that it is caused by a microbe which enters the body and multiplies there enormously, even to the extent of 16,000,000 in 24 hours. This microbe is called the *Bacillus tuberculosis*. Bacillus is the Latin word for a little rod or stick; and the creature is so named because that is what it looks like when seen under a very high power microscope, which is the only way it can be seen, and then only when stained red. In this condition the bacilli most resemble a lot of very small cuttings of fine red silk thread. It takes three thousand of them, end to end, to measure an inch in length, and there may be 200,000,000 of them in a spoonful of milk without one realizing that there is anything but milk in the spoon. These bacilli were found by Koch in the bodies of every one suffering from consumption; but that fact alone was not sufficient to prove that their presence was the cause of the disease. A few of the bacilli were taken

and put into a small glass tube containing a jelly or a bouillon, and the open end of the tube was plugged with absorbent cotton to keep other bacteria out. The tube was then left undisturbed in a warm place for some time. This is what is called a culture, for the bacilli grow and increase in numbers under these favorable conditions. Some of the matter was then injected into rabbits and guinea pigs. Guinea pigs are chosen for such experiments because the behavior of the disease germs in their bodies is most like that in the human body. After a lapse of time, some of the animals were examined and were found to be suffering from consumption. Others were allowed to die from the disease, and, on examination, like conditions were met as are found in human sufferers. Some of this matter was in turn used upon other healthy animals, and the poisonous nature of the bacilli proved beyond a doubt.

The disease is called tuberculosis, for in the progress of it, and after the germs have begun to multiply in the lungs, there are formed a number of tubercles. Tubercles are little tubers, and tubers are such root-like parts of plants as the potato. The tubercles in the lung are small roundish bodies about one-sixteenth of an inch in diameter. They are formed out of the healthy tissues in which the bacilli lodge and are of a grayish, semi-transparent appearance. They first become of a substance like cheese, and this later turns to pus. Little by little the germs multiply, change the tissues in which they live into tubercles, and break down all of the structure of the organ and scatter their poison through the body. The body tries to throw that poison off by fever, known as hectic fever in this case; the parts are slowly consumed, and the patient eventually dies of consumption. These tubercles are found in many other parts of the body besides the lungs. There are tubercular joints, hip joint disease, consumption of the bowels, and other parts are similarly affected by the bacillus, and in all of these affections tubercles are formed.

How Consumption is Spread.—The *Bacillus tuberculosis,* the cause of all infection, enters the body by several pathways. The most common of these is by the nose, mouth, and throat, in the process of breathing. Some also enter with the food and are taken into the stomach and the digestive organs. They leave the body of a consumptive person chiefly in the sputum, the matter which is coughed up during the progress of the disease. It has been estimated that a person suffering from consumption discharges into the air in the sputum from 200,000,000 to 23,000,000,000 of bacilli every twenty-four hours. If this sputum with its immense number of bacilli is spit out upon the sidewalk or on car

floors, and in similar places, there are several ways in which it may be scattered abroad to become infectious. The sputum may dry and be ground as fine under foot as dust to be whirled by the wind into the air. It is then one of the solid impurities of the air, and in that form is breathed in by those who come within its range. Or it may be tramped on by passers-by and attach itself to their shoes, or gathered up by sweeping skirts and be carried into the homes. Here it finds a lodgment and becomes dried upon the carpets. On sweeping the floors it is raised upward in the dust of that process to be breathed in by the occupants of the home. In such ways it invades the homes of all classes, and bacilli are present in rooms where there has never been a case of the disease and where it is least expected. That this is no alarming theory or a mere possibility was abundantly proved by Cornet, the Berlin scientist. He scattered a small quantity of sputum on the carpet of a room and allowed it to dry for only two days. He placed about fifty guinea pigs on the floor of the room. Then the carpet was vigorously swept. The guinea pigs were allowed to breathe the dust in the ordinary way. All but two of them died from consumption thus contracted. In the overcrowded and ill-ventilated clothing factories and workrooms in large cities there are present many conditions favorable to consumption; and the sputum carelessly discharged upon the floor is dried quickly by the steam heat of the buildings, and bacilli in great numbers are not only breathed in by the workmen but infest the clothing that is being made and which is sold all over the country. Even in the acts of sneezing and coughing by a consumptive, when no perceptible amount of sputum is discharged, a perfect shower of bacilli is violently forced into the air in the fine particles of sputum which always accompany these acts. Patients often smother a sneeze or a cough in the bedclothes, and so the bacilli are received into them. The mustache and the beard of a consumptive become perfect hives of infection, especially as so many men allow the beard to grow long, either for comfort or as a protection to the throat in cold weather. The walls of rooms in which a consumptive has lived and died have been known to retain the bacilli in an active state for over two years after the termination of the case. These are some of the ways in which bacilli are spread through the air and carried from place to place. No man lives long enough to be able to count, during his entire lifetime, the number of bacilli which a consumptive carelessly and needlessly discharges into the air in a few hours.

These myriads of bacilli are breathed into the air and are taken into the lungs by all who come in their way. Every one breathes them, and they lodge on the teeth, the tonsils, in the throat, and in the lungs of all, healthy and unhealthy alike. Dr. Cornet examined a very great number of healthy persons who were accustomed to frequent public places, and he found bacilli in the mouths of over 75 per cent of them. They lie there in wait with infinite patience, for upon the healthy, right living man their attacks are useless. But let him neglect his hygienic mode of life, let him be guilty of continued indiscretions, let him become weakened and enfeebled by disease, hunger, privation, and exposure, then he succumbs. And the patience and relentless attack of the invisible little microbe kill one out of every four persons.

And yet even the healthiest in appearance must not be too sure that they have never been caught by this ever present and watchful enemy. The post-mortem examinations have shown repeatedly that persons who had never been suspected of having consumption have had an attack, and the scars on the lungs prove that they had vitality enough or adopted right modes of living in time to overcome the attack, in other words, to become cured. These are not isolated cases. These revelations are of almost daily occurrence, and are the most convincing proof of the curability of the disease. No man can say positively either that he has not had consumption or that he is not now attacked by it. Were this possible, the stamping out of this insidious disease would be only a question of a very few years.

FIG. 45. COT AND BEDDING ARRANGEMENT FOR PORCH SLEEPING.

Persons Most Likely to Be Attacked.—There is great difference of opinion among scientists regarding the transmission of consumption from parents to children. Medical journals are filled with articles affirm-

ing and denying the possibility of the communication of the disease in this way. But upon one point all are agreed, that there is no doubt that children of consumptive parents, one or both, inherit such a weak constitution and so enfeebled a state of health, that they start life with a marked predisposition to the disease. These, then, form a large proportion of those who are liable to be attacked by consumption. But that does not by any means imply that they will take it. For facts prove that the very large majority of them do not take it. A statistician of a large insurance company gave facts before the Tuberculosis Congress in England that should set that point at rest forever. Forty thousand applications for insurance were refused because there was a family history of consumption. These cases were followed up, and it was found that less than nine per cent of that large number took consumption. Less than one out of ten took it. And this is the class which in popular opinion is doomed from birth because it is in the blood. If those figures prove anything they certainly prove that the inherited predisposition to the disease is no greater a predisposition than are those from other causes. For one out of ten the world over is the average mortality among all classes of people.

Right here let us drive home to the members of that class all the hope that this fact gives them. You are under no ban because your father died of consumption. You are not doomed to the disease. You are not going to die of it unless you are willing to. Your chances of escaping it are as great as anyone's, if you do your part. To this class are to be added all those who have inherited a weak state of health and a poor constitution from their ancestors. There is in fact no good reason why the two classes should be separated. The bacilli will find a favorable field for operations in both, in one just as good as the other. It is impossible to tell anything about a person's vitality or constitution, or power of withstanding disease, with absolute certainty from his appearance. Every one can cite case after case from his own observation, no matter how limited, of those who were apparently sound, splendid specimens who succumbed quickly to an attack. They can supplement this with other cases of those who were apparently not at all endowed with powers of resistance who have seemingly more than once come back from the gates of death. It is a fact that men of flesh and men of muscle have, in the great majority of instances, proved but too easy a prey to the bacillus of consumption, perhaps because too much was expected from their apparent vigor. Nearly every doctor has at

least a mental note of more than one instance where a whole generation of the same family of heavy, powerfully built persons succumbed to this disease, although they gave every promise of escaping all danger from it. The vital resistance to the disease was poor, although the physique appeared excellent.

There are two types of build which are particularly prone to the disease. The one is represented by those who have inherited a poor chest development, so poor that the lower portions of the lungs seldom if ever are filled with air. These have a light build, small bones, delicate features, thin skin, and blue veins about the temples. The second type is a remarkable contrast to these. It includes those whose bones are large, muscles powerful, of that build known as "lanky."

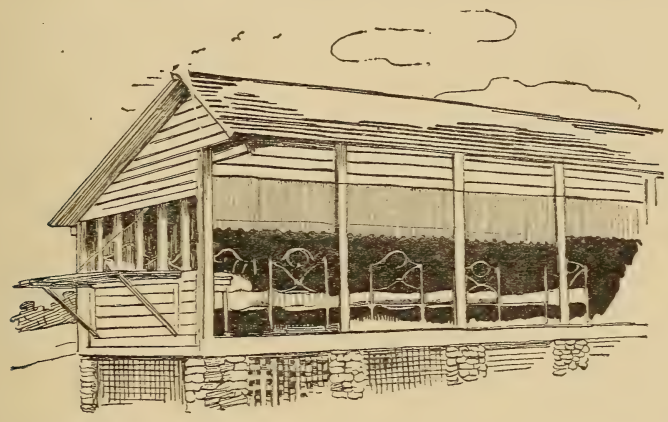


FIG. 46. SLEEPING QUARTERS AT THE SANITARIUM FOR CONSUMPTIVES AT LIBERTY, N. Y. A WINTER SCENE.

In these two types, especially the latter, consumption usually runs a rapid course. The last class of which we have to speak is the largest of all. It is larger than all others combined. It is those persons who do not live hygienic lives. The indiscretions, the carelessness, the ignorance, and the willfulness of men and women, together with the poverty of the lives of many of them, are the great predisposing causes to the deaths by consumption.

How Consumption May Be Prevented.—The first step in the prevention of consumption is to destroy the bacillus as soon as it leaves the body of the patient. As it passes off in the sputum, this means that the sputum from one suffering from the disease must be thoroughly and

effectively destroyed. There are several good ways of doing this. A regular sputum cup may be provided, in which a small quantity of the disinfectant and germicide, the perchloride of mercury, is placed. The perchloride solution is the regular 1 in 1,000 solution made by dissolving one-half an ounce of mercury perchloride (corrosive sublimate), and one ounce of hydrochloric acid in three gallons of water. This kills the germs or bacilli, and the destruction is complete. If there are facilities for burning the sputum, a paper cup, moist rags, old newspapers made into books, may be used to spit in, but they must be promptly and regularly burned. This care in the disposal of the sputum must be rigidly performed. There should be absolutely no spitting in public places, on the sidewalks, in cars, on floors anywhere, nor on carpets. As pointed out before, this is the most prolific means of infection. The bacilli are carried about on clothing, dry up and form dust, which is blown about and inhaled, and escape from infection is impossible. Not only should spitting in public places by consumptives be stopped, but the practice should be prohibited to every one. If a spitter have not consumption, and no one can be sure that he himself has not, he is only passing along such bacilli as he has inhaled and which have attached themselves to his throat and tonsils. The enforcement of the ordinance in some cities is not alone on the grounds of cleanliness but to prevent the spread of this disease. If a person must spit, let him be both sanitary and decent about it. Let him spit off the curb into the roadway; that is bad enough, and is also a means of infection, but it is not so bad as the risk of it being carried about on the clothing of passers-by into their homes. The danger of spitting on carpets as a means of infection has already been demonstrated. It is an easy matter to spit in spittoons which have water in them, to spit into a sewer grating, and generally to use a little precaution in disposing of the dangerous and offensive excreta from the mouth and lungs. It is not right that this matter should be swallowed, as there is very great possibility of carrying the infection into the stomach and bowels, both of which are extremely subject to tubercular infection.

A consumptive should also never cough or sneeze without covering the mouth and nose with a wet cloth. He should always have at hand for use a supply of such material, which may be burned after use. The acts of coughing and sneezing being both explosive in nature and intended to force matter from the lungs, throat, and nose, violently expel much of this infectious matter into the air.

A consumptive person should never kiss another on the mouth. In

spite of the comic paragrapher's humor on this point of infection, there is positive danger of communicating disease by this means. He should sleep alone and occupy a separate room. These points on the disposal of the sputum and other preventive measures have to do principally with the prevention of the spread of the disease to others. It is the dissemination of the bacilli that increases the possibility of infection by those who are disposed to the disease. A person who is predisposed to consumption should avoid infection as far as possible. He should live outdoors all that he can. Many have changed their occupations to secure the sunlight and fresh air, with most favorable results. The mortality is greatest among those whose occupations cause the breathing of particles of metal, stone, etc., and among those who are most confined. The glass-workers, stoneworkers, hatters, bookkeepers, cigarmakers, printers, supply a very large proportion of deaths.

Predispositions of all kinds are to be closely watched in the early years of life. If a child display a tendency in family history, build, constitution, or if he has been enfeebled by weakening disease, let him be given all of the outdoor life possible. Let him drop school for a time. Never mind if he does not keep up with his class; give him a chance to keep up with life. The rivalry of school classes and the fear of not making a school year with his classmates are sometimes very pernicious. The choice of a profession or of a career in life must be largely influenced by his physique. Dangerous occupations and those which entail confinement are not for children or young men and women with any predisposition to disease. An outdoor life is not only advisable but imperative in all such cases. Fresh air and sunlight are not only in themselves a means of destroying the bacillus and its poison, but are powerful agents in increasing the vital resistance to the disease. That is what all of the preventive means should aim at doing. Kill the bacillus, and build up a weakened constitution so as to withstand its attacks. The curative agencies, which will be taken up later for consideration, are to be employed to a degree in the prevention where a possibility of contracting the disease is feared.

How Consumption Begins: Early Symptoms.—Consumption begins by the admission, under circumstances favorable to its growth, of the bacillus into the lungs through the organs of respiration. What it will do after it gets in depends entirely upon the virulence of the bacillus, the state of health of the person, the condition of the organ or part affected, and the power of resistance of the individual attacked. If

there is no predisposition to the disease; if the person is in good health and is living a careful, hygienic life; if he is not weakened by an enfeebling disease, such as pneumonia, typhoid, measles, whooping cough, etc.; if his health and strength are sufficient to resist the invasion; then the bacillus can do nothing, but is expelled in time by coughing and spitting.

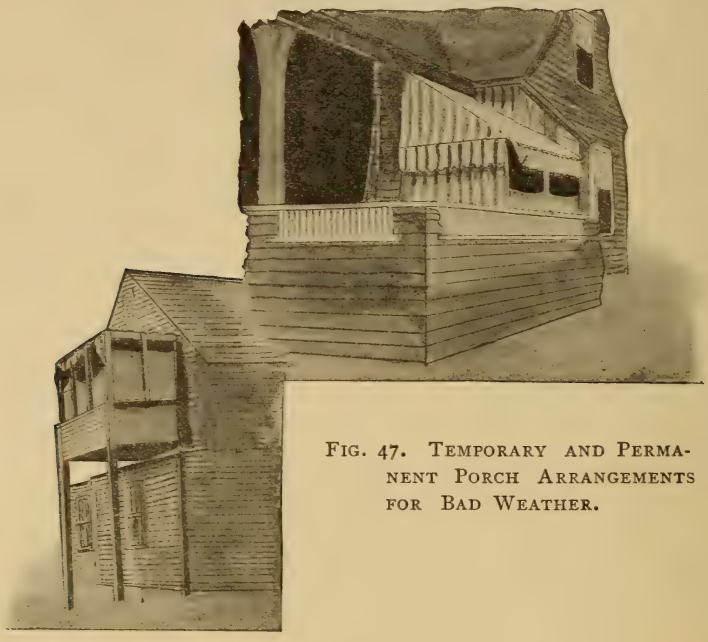


FIG. 47. TEMPORARY AND PERMANENT PORCH ARRANGEMENTS FOR BAD WEATHER.

But if any of these conditions are present, in a greater or less degree, then the bacillus begins to act. It first sets up an accumulation of cells in the immediate neighborhood. These cells vary in size and in the nature of their contents. They form a tubercle. In cases of cure, these tubercles, which contain the bacillus, are walled up by a tissue so that the bacillus cannot get out to attack other tissues, and can work no further harm. This is accomplished by a healing process, and when it occurs a scar is left on the lungs just as a scar always marks the place of a wound. This happens in hundreds of thousands of cases, and usually without the individual knowing that he has had the disease. This is important to be remembered, for there is no clearer and more convincing proof of the possibility of a cure of consumption than the fact that this cure takes place in so many cases, and often without any direct effort on the part of the individual. Certainly much more success can be hoped for when well directed efforts are made to bring about these very conditions.

But if the disease does not terminate in this way at this stage, the next step is the death of the tissues which have been affected by the bacillus, which passes on to attack other parts in the vicinity, the bacillus meanwhile increasing enormously and rapidly. If these tubercles are quite small they are called miliary tubercles, as they are said to be about the size of a millet seed; but when a number of these miliary tubercles unite to form one large tubercle, the latter is called a nodule, a word derived from the Latin and which means "a little knot." Inflammation sets up in the part affected, and, as is always the case when inflammation occurs, there is a secretion which surrounds the tubercle and confines or limits the operation of the bacillus to that particular area, and so prevents the spread of the disease for a time. This matter secreted by the inflammation surrounds the tubercle with the bacilli, and, in a very great number of cases, grows into a tough envelope or covering so strong that the bacilli are walled up inside of it, cannot escape, and are either prevented from getting out as stated or are destroyed. The part of the lung inside of the envelope dies or becomes useless for breathing purposes; the scar is left and the disease is stopped. This, then, is a cure at a later stage of the disease.

FIG. 48.
SLEEPING OUT OF DOORS ON AN OPEN PORCH IN FINE WEATHER.

If, however, the wall or envelope is absorbed while the bacilli are alive and active, or if it breaks down and allows the bacilli to escape, the attack is at once made upon the lung tissue, and the operations are extended. Sometimes a disease like pneumonia, typhoid fever, or influenza works a change in the envelope or covering of these walled up sections of the lungs, and an attack is made by the liberated bacilli upon the neighboring tissues. This is the condition popularly known as "rapid decline," which often follows these and other diseases. This stage of the consumption may have existed unsuspected for some time,

and it took the other inflammatory disease to break down the sealed up barriers and to give the disease full sway with a speedy termination.

The formation of this envelope or barrier to the further progress of the disease does not always take place. Where there is little or no resistance to the attacks of the bacilli, a general spreading of the poisonous matter takes place through the tissues, and, as there is nothing to impede its advance, the course of the disease is very rapid.

Early Symptoms.—In the cure of consumption so much depends upon its speedy detection that it is well to have in mind the early symptoms of the approach of the disease. It is not supposed that these are always within the power of the ordinary person to detect. There must always be the assistance or direction of the physician. No one is capable of diagnosing his own complaint. Even physicians do not attempt this in their own cases when ill, but every one should know the warnings of the approach of consumption so as to be able to tell when a thorough examination by a skilled physician is needed. The neglect to do this upon reasonable grounds for suspecting the existence of incipient consumption is criminal negligence.

It is a common belief that an attack of consumption is heralded by a cough. This is not true of a very great many cases. Sometimes the first symptom is a rise of temperature in the evening. This rise may be very slight and be preceded by a chilly sensation. A clinical thermometer will tell whether this rise is real or fancied and the extent of it. The average normal temperature is 98.4°, and the temperature should be taken during the day and at evening for comparison.

In other cases the first symptom is persistent hoarseness. That is when the effects are first shown in the larynx. When this huskiness of voice does not quickly yield to ordinary treatment, an examination for consumption must be made. "Only a slight cold" works a lot of damage at this stage of the disease.

Again, the earliest symptom may be the spitting of blood. This does not always mean consumption, but in the great majority of cases it does. It may mean acute pneumonia or some form of heart trouble, with rupture of the blood vessels, but both of these conditions will soon be determined by examination.

The symptoms of consumption do not develop in the same order or in the same degree in all cases. If they did the task of deciding accurately would be much simplified. There are two symptoms which come some time or other in all cases. They are fever and loss of weight.

The fever of consumption does not usually run to very high temperature. It is generally moderate, and runs from 100° to 102° and rarely to 103°. If it runs higher than this it may be caused by some complication such as blood poisoning. It is high in the evening and low in the morning. It is easy to relieve it but only temporarily.

Loss of weight is caused by loss of appetite, cough, and consequent loss of sleep, and by exhaustion, indigestion, anæmia, and the absorption of poisons generated by the disease. Sometimes the loss of flesh proceeds at the rate of four or five pounds a week. This is a sign that the disease is making rapid progress. Gain in weight, on the other hand, indicates that the disease is making slow headway, or that its progress has been stopped, and that the healing, walling-up process has begun.

FIG. 49. A SHELTERED COT FOR AN INFANT TO SLEEP IN OUT OF DOORS.

Night sweats, as so many suppose, do not aggravate the disease; but on the contrary, are the natural means of relieving conditions. They are to be regarded as an effort to reduce the effects of the absorption of poison into the system. For it is by the perspiration of night sweat that the poison of the disease is carried off.

The cough is a very generally constant symptom of the disease. It is usually worse at night and in the morning on rising. As it is a remedial means of clearing out the accumulations in the lungs, it is not to be stopped. At first it is a dry hacking cough, and is not accompanied by much discharge, for the simple reason that the disease has not progressed far enough to form matter in the lungs to be discharged. It is the method by which the lungs are kept clear. Later, when there is much discharge, it is sometimes so severe as to cause loss of sleep, exhaustion, and even vomiting.

When sputum is present it, too, is a symptom, for it is capable of microscopical examination which will disclose the presence of the bacilli.

The Board of Health in the city of New York is equipped to make a free examination of sputum, and give a report on its condition, and the presence or absence of bacilli in it. Still, it must be remembered that the absence of bacilli in sputum is no proof that the disease is not present at that time. Bacilli may be present in the lungs but in the walled-up condition already mentioned.

Modern Methods of Curing Consumption.—It is well to start with the clearly stated announcement that there is no medicine known which will cure consumption. Those who rest their hopes upon this or that medicine which they have read about, or been told about, are leaning upon the worst sort of a broken reed. They are not only not going to be cured by any of them, but they are wasting valuable time and are allowing the bacilli to get such a start upon them that they will probably never overtake the disease or head it off. This plain statement is made without reserve. There are some medicines which will help him in the complications which so often attend this disease. There are some medicines which, in the hands of the proper person, will relieve him of pain and inconvenience. But there are positively no medicines which will cure consumption. Those which will help him will be considered in the proper places as they come up. The things which do cure consumption, and are curing lots of cases every year the world over, do not come from drug stores or out of bottles. They are abundant, and yet are, in some cases, hard to get. The first is fresh air—not a little bit of fresh air through a half inch of raised window once in a while, but a regular supply of it got by living out of doors, sleeping out of doors, if possible; at any rate, by being out of doors as much as possible. Fresh air will not only kill the bacilli but will give the patient a vital power to resist the disease

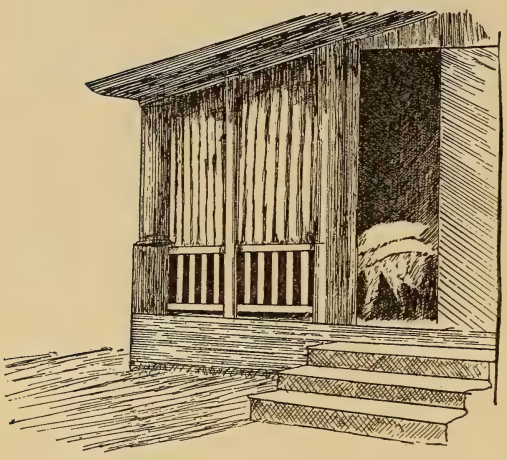


FIG. 50. ARRANGEMENT OF AWNINGS ON A LOWER PORCH FOR SHELTER IN BAD WEATHER. THE HEAD OF THE BED IS SEEN THROUGH THE OPENED DOOR.

and to seal the germ up in a sac whence it cannot escape and so destroy it. There are places where a consumptive can live out of doors, and there are other places where he cannot. The thing, then, to do is to find out where he can live out of doors and to get there as soon as possible. The one great thing is to get where it is dry. Humidity is above all things to be avoided, for it is the life of bacilli. The old much-vaunted efficacy of the sea voyage on a sailing ship is all over and forgotten. There are no more good old sailing vessels, and even if there were, the air at sea is not dry, but damp. There are seasickness, personal discomfort, and being shut up in stuffy places during bad weather. All of which will not do. In the out-of-door life the temperature makes no difference. Dress accordingly. People get well in the cold, dry air of Canada and the northern states just as well as in Florida and on the Pacific coast. The old theories of not going out before 9 A. M. or after 4 P. M. are exploded. Not only go out but sleep out if you can. Of course you can in summer, and, with proper arrangement, you can in winter too. Hundreds are doing it to-day and are getting well too. Draughts? They are better forgotten. The fear of them and the precaution to avoid draughts that never existed, or never came near a patient, have killed more consumptives than direct draughts ever did. If you can, sleep in a tent out in the open where there is plenty of good, fresh air. The tent is sheltered from direct winds; and it is made of thick canvas that the air does not blow through. The air is admitted in ventilators in the sides and passes out of the top. There is no draught. Night air? That is another bugbear. As Florence Nightingale said, when told that one must not breathe the night air: "Why, doctor, what kind of air must one breathe at night if one cannot breathe night air?"

FIG. 51. TENT WITH VENTILATOR AT THE TOP, FOR PERMANENT OUT OF DOOR LIVING.

Where tents are impossible, and they are for 90 per cent of consumptives, a back porch, a sheltered place outside in summer and under an open window in winter, can easily be secured, and they will work

wonders. It is not the tent that cures; it is being out in the best air, the purest air than can be procured. It is possible to protect against all sorts of low temperature by having enough bedding. A consumptive must get the best air all of the time, not part of the time, but all of the time. Good fresh air in the daytime and vitiated bad air of the house at night is not half treatment; for the germs make more headway at night than the patient did in the daytime.

There is no doubt that sanitarium treatment is best for those who can afford it. Because there is discipline there, and things must be done. There is no interference with the arrangements of a home or with the comforts of others. The treatment is continuous and is thorough. But the patient should not go alone if inclined to worry or to homesickness. That will interfere with his rest of mind, which is absolutely necessary to a cure.

FIG. 52. CLOTHING AND BED ARRANGEMENT FOR A CHILD TO SLEEP IN, ON A PORCH.

In the ordinary out-of-door life of a patient during the day, it is easy to provide a sheltering wall or shield from the wind. It should be thoroughly exposed to the sun and have the direct rays of the sun shine upon the patient. Sunlight and fresh air will do more towards effecting a cure, even in a locality that is theoretically bad, than the absence of them in the best climate in the world will do unaided. This is to be borne in mind with relation to those cases where a patient cannot avail himself of good climatic conditions. Where it is possible to secure altitude in addition to dryness of climate, a height of from 3,000 to 6,000 feet is desirable. This is helpful because the rarity or thinness of the atmosphere at that elevation obliges the patient to breathe with all of the available lung machinery in order to get enough air. That keeps the lungs well exercised and exposed to the action of the air. But weak heart and high pulse indicate that a high location be not chosen. There are scattered now all over the country numerous good sanitariums which are doing splendid work in curing patients and in stopping the spread of the disease. Where such results can be shown by the methods herein advocated, cures of 72 per cent in incipient cases and 46.11 per cent in advanced cases, there is much to be hoped for even in home treatment.

Diet.—The matter of diet is to see that the patient eats plenty of nourishing food. This is not so much a matter of appetite as of seeing that he eats enough. There are at least six meals a day. Not much food is to be taken at a time; but be sure that there is plenty of it. If the weight of the patient can be kept increasing, that is a sure sign that the ravages of the bacilli are being checked. Milk, eggs, fat meat, and hard bread are the chief articles of diet. The aim is to have the patient eat six meals a day and to drink three quarts of milk and to eat a dozen raw eggs besides. All of the food is to be well chewed, even the milk is to be sipped and moved back and forth in the mouth so that it is practically digested before it is swallowed. In this way it will not curdle nor will it make the patient bilious. Such are the principles of diet. But a more extended course with greater variety may be given. The patient's digestion must be moderately good to follow such a diet as is here suggested:—

FIG. 53. SUGGESTIONS FOR THE CARE OF A CHILD IN ANY WAY PREDISPOSED TO CONSUMPTION.

Before rising he may sip a cupful of hot milk. Sipping is essential to good digestion of milk. Rest for fifteen minutes. Then bathe and dress.

Breakfast: Oatmeal or other nourishing cereal, to be well chewed. A chop or small steak. Dry toast. Tea or coffee if used to it and it does not make him irritable. An orange or other fruit.

Light luncheon between breakfast and midday meal: Cup of broth. Piece of toast. A glass of koumyss. A scraped beef sandwich. Eggs raw or cooked. Sherry or red wine; or a glass of good Scotch or rye whisky if desired.

Midday dinner: Soup, preferably a thin soup. Really fresh fish. Roast or broiled meat. Vegetables: potatoes, string beans, macaroni, spinach, asparagus. Sherry or whisky and water. Cornstarch or rice pudding.

Light luncheon in middle of afternoon: Similar to mid-morning luncheon.

Supper: Arrowroot. Eggs. Stewed oysters and toast.

Evening luncheon before going to bed: Cup of broth. A glass of koumyss. Cup of hot milk. Curds and whey.

This or any diet must be supplemented by all possible aids to digestion, such as pepsin, pancreatin, taka-diastase. The bowels must move regularly. The size of the meals must be regulated according to the patient's condition. If he has spent a restless night he has not much nervous energy left. Therefore the meal must be a light one. If it has been restful he can digest a heartier meal. If the tongue is coated or foul, the amount must be lessened. It is upon such matters as these that the physician's advice must be sought and rigidly followed.

FIG. 54. ARRANGEMENT OF THE BED IN A ROOM WITH TWO WINDOWS—BOTH WIDE OPEN.

Exercise.—If the area involved is small and the general and muscular health of the patient is good, he may take gentle exercise, but under no conditions become fatigued. If the lung area affected is large or if the patient's health is below the average, he does not want exercise. Exercise causes heavy breathing. The lungs of a consumptive are wounded. No one thinks of working a sore hand or foot to make it heal. They let it rest. That is what must be done by the consumptive. He must let his lungs heal. It is infinitely better for such to sit around in the sunshine and fresh air conserving all of the energy they have and devoting it to the digestion of as much nourishing food as possible. If such feel the need of exercise it is best given in the form of massage. In cases where the ambition of a patient exceeds his discretion, and he wants

to walk miles, and play golf over long links as he used to do, that is where the discipline of a good friend or doctor comes in. Every time a patient gets tired he undoes all that has been done towards gaining resistance to the ravages of the disease. One indiscretion in that direction puts him back several weeks. Rest for the body and rest for the mind; freedom from worry and the cares of business, will be absolutely necessary to a cure. Everything should be dropped and the attention concentrated upon the cure.

FIG. 55. SECURING A SUPPLY OF FRESH AIR BY OPENING ALL OF THE WINDOWS.

How to Live Out of Doors.—It is presumed that the patient has selected the driest possible climate for outdoor life. To those who can afford to go to a sanitarium, there is little to be said further than to go there is quickly as possible. It is to those who cannot, as well as to those who are curious to know what is the modern practice of curing consumption, that these directions are given. There is first a tremendous prejudice to be overcome about taking cold. That is the great bugbear in the way of the ready and universal adoption of the methods here advocated. Let it be said as convincingly as possible at the outset that you will not take cold as readily or as frequently if you adopt the outdoor life as you will if you follow the indoor life. Besides if you have consumption and continue to live indoors, with a little outdoor life in the warm part of the day, you will die. If you live outdoors summer and winter, night and day, fine weather and bad weather, you will get well. Forget all that you have ever heard about draughts, chills, and night air, and do as thousands are doing while you are reading this, and get well.

You are not to suffer the least discomfort in following the outdoor living. If you do, you are not doing it right. In fact, if you do not feel better out of doors than you do indoors, there is something wrong in the way you are trying to do it.

Shelter.—You are not to sit out exposed to the wind in winter or to the intense heat of the sun in summer. You are to be made as comfortable as possible. While you are to be out of the wind you are not

to be away from the direct influence of the fresh air and of the sun. The fresh air and the sunshine are what you are outside to get, and if you do not get all that you can, you are only half doing your share.

First of all, get a comfortable chair. Remember that you are going to sit many hours a day in that chair, and it must be as restful and snug as it can be made. A rolling chair or a wheel chair is very desirable, because it is so easy to move about as the wind changes, or as the sun changes, or when you desire to change the scene. Besides, with such an easy chair to move, you can often wait upon yourself when it is not convenient for others to do so on the moment. An adjustable reclining chair is very good, as it places one at the comfortable angle and will take a larger and softer cushion. Or a canvas chair, which fits itself so well to the shape of the body, is restful. The cushions of the chair are to be as soft and thick as can be provided; a mattress is often desirable, and can be adapted to a large chair very effectively. A table or book rest is indispensable for reading and writing; for writing is indulged in even when the thermometer is at or below zero, and when the ink freezes at the point of the fountain pen.

FIG. 56. HOW TO DRESS FOR OUT OF DOOR LIVING IN COLD WEATHER.

If the house has broad porches or verandas, one can always find a sheltered spot in any weather on the lee of the house. But even there a screen, such as must be provided in the absence of porch room, is convenient. If this is of glass, so much the better, as it will not cut off the sunshine. This does not mean the complete walling-in by glass, but is only a small shield against the wind. In a shut-in porch, with glass all about, one is little better than when in a room. If glass is not procurable, any form of shield will answer. It should be easily movable, not too heavy, and yet not light enough to blow down in the wind.

Clothing.—Again the rule is: be comfortable. It is not intended in the outdoor cure that the body shall be cold. That is not what cures. Cold air is good not because it is cold but because it is dry. Dry air is just as curative in summer as it is in winter. Remember that you are living where you can get the freshest of air all of the time. As long as that fresh air gets free and abundant access to your lungs that is all

that is needed. Comfortable clothing is easily enough secured in the summer and while it is warm; but the comfort on cold stormy days is a matter of experience. It is not right to go out for a little while improperly or insufficiently clad, get chilled, and then come in to a warm fire to get warm and then to go out again. That means that you sit beside a warm stove until the pores of the skin open; then when you go out to the cold air again, the pores are suddenly closed, and the result is a chill and a cold. You are not taking much exercise while you are out, so it is necessary to be well clad. Right here you must be careful to remember that weight of clothing and warmth of clothing are not to be confused. Do not rely upon heavy underclothing, but upon warm outside wraps. It is from them that the protection will best come. The material of which they are made is of little importance; but it is of the greatest importance that they be warm enough. That is the only test of their fitness. A loose fitting outer garment is not so warm as a rather tight fitting one. It should fit close at the wrists so as not to allow the cold air to affect that particularly sensitive part of the body. A high collar, or, better still, a cape will be found of great service in keeping the neck warm.

FIG. 57. SLEEPING IN A ROOM WITH ONLY ONE WINDOW. THE HEAD OF THE BED IS PLACED OUTSIDE OF THE ROOM, IN THE OPEN AIR.

Women will find a small shawl a sufficient covering for the head.

Men should have a cap with flaps to pull down over the ears and a peak to keep the sun from the eyes is desirable.

The hands are best protected by mittens. Gloves separate the fingers and are not nearly so warm. A pair of cotton gloves of large size may be worn under warm woolen mittens. This is found to be a very comfortable arrangement.

The feet should be protected by loose-fitting, comfortable shoes. Two pairs of woolen socks or stockings are warmer than one thick pair. The very great value of newspapers as a means of keeping out cold and of keeping in the warmth of the body must not be forgotten. These can

be placed over the chest, the back, and around the feet, with great advantage.

Sleeping Out of Doors.—The most satisfactory results are secured from sleeping in a tent. This is pretty generally the methods of the best sanitariums. Perfect shelter and protection against all kinds of weather is secured by its use. The ventilation is provided by the passage of the used air out at the top. Such a form as that shown in Fig. 51 is a standard. But shape has little to do with it.

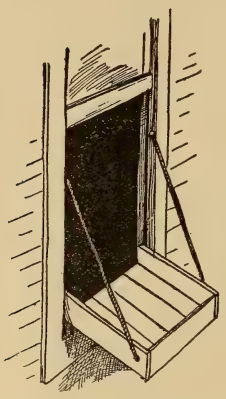


FIG. 58. A SHELF OR SUPPORT OUTSIDE OF THE WINDOW UPON WHICH THE HEAD OF THE MATTRESS MAY REST.

A porch may easily be fitted up with protective awnings so as to form an ideal sleeping place, free from exposure to weather and to the curious.

Many houses have upstair porches or balconies, which afford abundant shelter with a little added sense of security.

Where such conveniences cannot be obtained, one must fall back upon indoor sleeping with full ventilation. If there are more than one window in the room, close the door, so as not to affect the rest of the household, and open all of the windows. The arrangement of the room under such conditions is shown in Fig. 54.

Where there is only one window available, there are several ways of arranging. One is nothing more nor less than putting the head of the bed out of the window. Where shelter against observation is desired, an umbrella may be raised, but awnings or screens will be better. Care must be taken that not more than one-third of the length of the bed is permitted to project, as there would be danger of the bed tipping if more were used. A weight may be attached to the lower part for additional security.

A convenient sort of platform is arranged outside of the window upon which the mattress is placed. The inner part is built up to the required height so that the bed is on a level with the shelf.

As a last resort, when no other accommodations are at hand, raise the window to the full height and place the bed directly under the window.

DETECTION AND RECOGNITION OF DISEASE.

The first step in the detection and recognition of disease is a careful and thorough study of the patient. Do this in all cases before looking for the symptoms under the head of any disease. There is a very decided suggestion of symptoms which do not exist when one reads a printed list of them. Writers of patent medicine advertisements know this effect full well, and take advantage of it to the utmost in preparing their matter. Jerome K. Jerome, the English humorist, gives a ludicrous description of his own sensations when he studied a medical encyclopedia from A to Z and found that he was suffering acutely from every disease but one mentioned in it.

Let the mind be perfectly free from all suggestion or prejudice and write down a list of such conditions as seem to be most marked. Do this leisurely and carefully from your own observation and the assistance of the patient's complainings. Then, but not till then, consult the list of symptoms arranged for ready reference on page 206. Suppose, for illustration, there is a fever of 102 degrees shown by the thermometer; bad breath; breathing through the mouth; difficulty in swallowing; and a chill has preceded the fever. On looking up these in the list of symptoms beginning on page 206, it will be found that tonsilitis or inflammation of the tonsils is the only disease which appears in every list of diseases under all the symptoms mentioned. By referring to that disease on pages 336, 337, and 338, one's suspicions are confirmed.

In order to facilitate the search for symptoms, one must be familiar with the details given in the following pages, where the appearance of the several parts of the body under disease is clearly given. Such aids as the thermometer and the ability to use it should always be at hand.

A casual glance at symptoms of diseases will show the very great number of cases in which an increase in temperature is an early indication of disturbance. The taking of the temperature is one of the first things to be attended to in cases of illness. If fever is present, one can easily determine the severity of it by the degree indicated on the thermometer.

The condition of the pulse, the presence of pain, the appearance of the tongue and eyes, the presence of any eruption, the condition of the skin, the nature of a cough, are a few of the subjects which should receive attention.

The necessity of a careful study of all of these conditions cannot be too deeply impressed. For this is the starting point of the application

of intelligent assistance. As an accomplishment, there is nothing to equal it in other lines of education, for nothing else brings so fully into play the exercise of the benevolent affections for the relief of the suffering.

One must not be deterred from approaching the subject of detecting and recognizing disease on account of the proverbial difficulty of making a correct diagnosis. Because there are certain aspects of the study that are beyond the skill of experienced physicians, is no reason why one should decline to go as far on the road as one's opportunities and ability will permit.

It is a very decided step in advance to be able to distinguish between states of severe illness and simple indisposition; to know whether or not a patient requires the services of a skilled physician; to be able to detect the onset of dangerous and infectious diseases; and to minister to the wants upon such general lines as may abort a threatened attack. All of this is quite within the range of possibility for persons of ordinary intelligence to do with a fair measure of success.

PRODROMAL SYMPTOMS OR WARNINGS OF DISEASE.

Disease is any deviation from a state of health, and is always preceded or accompanied by certain well-marked symptoms of its approach or presence. Those which precede it are called "Prodromal Symptoms," because they are forerunners to warn us of an impending attack. They come as warnings to us, often very timely, and we may ward off an attack or succumb to it, according as we heed or ignore them. Some of these symptoms are very plain and can be detected by us all; others require not only a practised eye to observe, but a mind trained by long experience to recognize the diseased condition which they indicate. It is one thing to read the sign and another to understand it. There are, then, a number of symptoms which are beyond us to interpret correctly; but there are a great many that we can all see and understand. It is the latter that we should learn in the interests of the comfort, well-being, and even the life of ourselves and others.

There are two broad classes of symptoms. First, those which the sufferer alone knows about, called "Subjective Symptoms"; and, second, those that another person can see, called "Objective Symptoms." The first class is the one about which the physician asks his patient so many questions. Upon correct and exact answers to those questions much depends, and care should always be taken to give the doctor a clear understanding of the nature of the pain, its location, and other details. Do not withhold any information from him. The more you can tell him about this class of symptoms the better for you. Very young children, of course, are unable to help in this way, and it is necessary to work upon the second class of symptoms, or to be aided by the child's sign language, which is often helpful.

The second class of symptoms, the Objective, are really signs of disease because they are visible and can easily be read correctly by an observing person.

General Appearance.—There is a certain indefinable something in the appearance of one who is threatened with disease which suggests that he "is not well." Closer observation and attention to detail will inform us that this general appearance of ill-health is made up of a number of separate indications which can be noticed individually, and which, put together properly, will lead to what the doctor calls a correct "diagnosis" or reading of the disease. An intelligent understanding of these warning

signs will prevent us from committing one of two serious mistakes: either magnifying every slight ailment, and thereby needlessly alarming both the patient and ourselves, or neglecting to summon medical assistance in time.

In studying the details of the case, we endeavor to find out in what way the changed appearance has come about. We are so familiar with the normal and usual appearance of those in our own families that we should be able to detect any change that may come to one of its members.

The Face.—Sudden paleness may be a sign of fainting, or of an internal or external hemorrhage.

Constant paleness is a sign of anæmia, insufficient blood.

A flushed face is a sign of feverishness, and calls for the use of the thermometer.

A livid or bluish appearance of the face and lips indicates a disturbance in the breathing or in the circulation of the blood. There is also a possibility of congestion of the brain. It is also present in choking, suffocation, whooping cough, and in the presence of a foreign substance in the throat.

Distortions of the face are caused by pain in any part of the body, and vary with the intensity of the pain. Very marked distortion of the features is an indication of convulsions, epilepsy, hysteria, St. Vitus's dance, and paralysis.

A peculiar dark blush is noticeable in pneumonia.

Eruptions, appearing first upon the face, may be measles, German measles, or other eruptive fevers.

The lips are drawn and surrounded with a white ring or zone, the ears are cold, the eyes hollow, and sometimes the muscles of the face set, in the severe pains of peritonitis, inflammation of the bowel (peritoneum).

In cases of hysteria one is struck by the peculiar woe-begone expression of the patient's face when the symptoms are under discussion, and by the rapidity with which the expression changes when the mind is diverted into a different line of thought.

There is the brightness of the eye, which is seemingly on the alert to catch any sign of hope of recovery, to be remarked in patients suffering from advanced phthisis, and the pale, emaciated face is in marked contrast to the deep hectic flush over the cheek bones.

Again, in people suffering from kidney disturbances, one notices the peculiar doughy appearance of the face and the puffiness under the eyes;

a physician will often make several examinations of the urine before he finally is able to confirm his suspicions which were aroused by these same symptoms.

When a patient is seemingly indifferent to all surroundings, or mutters in delirium, the face being expressionless, we find the case one of low running fever.

The Tongue.—We all know that almost the first thing a physician does is to ask to see the tongue. Florid redness is a sign of dyspepsia; a livid or purple tongue shows that there is obstruction of the circulation, or of respiration; a pale or white tongue denotes a weak and impoverished state of the blood; a furred tongue is common to some people even when in health, but, when there are bright red points beneath the fur, scarlet fever may be present; a tongue with red edges and furred in the middle is a sign of intemperance or indicates brain disorder. In feverish conditions of the system, the tongue becomes very dry and hot, or parched; when the tongue is clammy and viscid, there is usually derangement of the digestive functions; a yellow tinge on the coating of the tongue indicates a biliary or liver disorder; a thin, creamy white coating, inflammatory disease in the abdomen. In sore throat we often find the tongue of a dingy, whitish color; in scarlatina, we have elongated papillæ, appearing as bright red spots; and in some forms of intestinal irritation and hemorrhage, and after acute disease, it is clean and bright red. In anæmic patients, we find this organ partaking of the general condition of the system, being pale and flaccid; in paralysis, it is drawn on one side; in delirium tremens and nervous affections, it is tremulous; and in some stages of typhoid fever it becomes almost black and cannot be protruded.

The Gums and Lips are also indicative of certain conditions of the system:—

When the gums are swollen, and bleed at the slightest touch, there is reason to believe that the system is generally out of order, in a state commonly called scorbutic (scurvy). Swollen or spongy gums are also a sign of disorders of digestion, of certain types of anæmia, and of diabetes. In ulcerative stomatitis, we have ulceration along the gum line. Anæmic patients have pale gums. Different poisons produce discoloration of the gums. Lack of cleanliness is not an uncommon cause of redness along the edge of the gums.

Copper poisoning causes the gums to have a greenish-blue line at the edges, while a pale bluish-red gum, with a marked line of blue at

the edge, is a sign that lead has been taken into the system in some way. In mercurial stomatitis a blue or red margin is found, and scurvy produces a purple coloration.

The Lips.—When the lips are parched and cracked, with fetid breath, there is reason to suppose that fever is present in a typhoid form, though this is by no means a certain sign in itself. Pale lips often suggest anæmia and other diseases in which the skin is pallid, and often the first symptoms of cardiac (heart) disease is detected from their blue color. Trembling or twitching of the lips may be caused by paralysis, severe pain, or emotion. A common symptom of epilepsy is a foam on the lips.

The Eye.—The eye is a valuable indication of nervous condition and affections of the brain.

Contraction of the pupil of the eye occurs in paresis (slight paralysis), locomotor ataxia, meningitis, tumor of the brain, etc.

Dilation of the pupil occurs in epilepsy, hysteria, paralysis of the third nerve, paresis, and locomotor ataxia.

Unequal size of the pupils is also noticed in paresis, locomotor ataxia, and nervous diseases of the iris.

The filling of the eyes with tears and the accompanying inflammation, which precede influenza or "cold in the head," and measles, are familiar.

Excess of bile in the system is indicated by the greenish-yellow color of the "white" of the eye.

Trembling eyelids indicate extreme nervousness.

Rolling of the eyes accompanies convulsions and other spasms.

The Pulse is one of the chief indications of disease. When the pulse is large, rapid, and soft, it indicates the early stage of fever or of acute inflammation, as in scarlatina, erysipelas, inflammation of the lungs, etc. When very frequent, large, and hard, it accompanies the full onset of fever, of an inflammatory kind, such as rheumatic fever, smallpox, etc. A moderately frequent, large, and hard pulse may be that of mere fullness of blood. When frequent, hard, large, and thrilling, there is generally some disease of the artery, or in its close neighborhood, such as aneurism or tumor. A frequent and small pulse is often met with in consumption, in which the quantity of blood is diminished, and is equally impaired. A slow, laboring, large, and hard pulse is often attendant upon apoplexy or other forms of pressure on the brain.

Fever is indicated by a rise in temperature above normal (98.2°) and

can be ascertained only by use of the clinical thermometer. The degrees of fever are:—

Feverishness,	99° to 100°
Slight Fever,	100° to 101°
Moderate Fever,	101° to 103°
High Fever,	104° to 105°
Intense Fever,	105° to 106°
Highest Fever,	106° and over.

Diseases of the Heart.—The heart, from the important part it plays in the animal economy, is subject to various serious, and often fatal, diseases. The ear is the principal means of obtaining a knowledge of the state of the heart, and by auscultation and percussion we are enabled to detect the existence of various diseases. The heart gives out two sounds, known as the first and second, which are distinguished from each other. The first sound is longer than the second, and the interval between the first and second sound is shorter than that between the second and first. They have been compared to the two syllables, *lupp, dupp.* Any manifest alteration in these sounds is indicative of the existence of disease. They may be high or low, clear or dull, muffled, rough, intermittent, etc. Murmurs or regurgitant sounds may arise from disease of the valves. The power of distinguishing between the normal and abnormal sounds of the heart, and of the causes producing the latter, can only be obtained by lengthened experience. Diseases of the heart are usually divided into two classes: first, functional or nervous: and, second, structural or organic. Chief among the former are palpitations, syncope or fainting, and angina pectoris. They are chiefly to be met with in persons of a naturally nervous temperament, more especially women suffering from hysteria, or other like complaints, and may be induced by great mental excitement. In such cases great attention should be paid to the general health, using tonics, sea bathing, and gentle open air exercise, to strengthen the system. Violent exertion, and strong mental excitement, are particularly to be avoided. Among the principal organic diseases to which the heart is subject are pericarditis, carditis, endocarditis, atrophy, hypertrophy, dilation, and valvular diseases.

Disease of the valves so commonly follows endocarditis, if of long continuance, that it may almost be considered as a chronic form of that disease. It is a thickening of the internal lining of the heart, especially at the valves. It becomes not merely thickened uniformly, but is the seat of warty excrescences, and even cartilaginous and osseous formations

of considerable size, extending into the cavities of the heart. In old persons, and especially those addicted to a generous mode of living, we most frequently meet with ossification, the effects of which are congestion, difficulty of breathing, apoplectic seizures, and other symptoms of embarrassed circulation.

Breathing.—The normal rate of breathing is about eighteen respirations per minute for men, slightly more for women, and still more for children. Difficulty in breathing may result from obstruction of the air passages, pressure upon the lungs, diseases of the lungs, swelling of the abdomen, heart disease, asthma, anæmia, hemorrhage, or paralysis of the muscles of the chest and thorax. If difficulty occurs while breathing in, there may be a foreign substance in the larynx or trachea. If it occurs on breathing out, there is probably loss of elasticity and tone of the air vesicles in the disease known as emphysema. It is most common in a combination of the outward and inward acts of breathing.

If difficulty in breathing takes the form of shortness of breath, not due to exertion, it indicates severe heart or lung disease. If it is due to exertion it is not serious, but may indicate weakness, anæmia, or stoutness.

Slow difficult breathing occurs in the coma or insensibility of diabetes.

Rapid difficult breathing is noted in inflammation of the lungs, pleurisy, pain in the chest muscles, fever, heart disease, anæmia, and diseases of the base of the brain.

Irregular difficult breathing, now fast, now slow, is serious, and occurs in apoplexy, meningitis, tumor in the brain, fatty degeneration of the heart, and other similar diseases.

In labored breathing, such as is seen in diphtheria and croup, it seems as though every muscle of the chest was brought into play.

Interrupted, wavy, or cog-wheel breathing is a broken or interrupted breathing inward, caused by nervousness, unequal or irregular contraction of the muscles of the chest; or irregular expansion of the lungs from disease.

Suppressed breathing is the entire absence of the breathing sounds. It occurs when the lungs are filled with the water or effusions in pleurisy, or in other solid conditions of the lungs.

Mouth breathing indicates a stoppage in the nasal passages, usually by adenoid growths.

The irregularities of breathing and the condition of the lungs are indicated to the physician by use of an instrument called a stethoscope,

which he places against the walls of the chest, front and back, with the ear-pieces to his ear. The breathing sounds are magnified or intensified, and reveal the condition of the lungs. Very often the examination by auscultation, as it is called, is conducted by placing the ear against the chest walls, by which means the sounds can be heard. The examination is still further assisted by tapping the fingers placed upon the chest so that a sound is made over the lungs which tells the state of the lungs. A hollow sound is given by those parts of the lungs that are filled with air and consequently are in good condition, while those parts which give a dead, dull sound are filled with water, pus, sputum, tuberculous, or other matter, and are, consequently, inactive and diseased. The tapping examination is known as percussion.

Coughs.—A cough may be the result of various conditions, but one of the most common causes is a severe cold upon the lungs. The air passages are lined by a thin, delicate mucous membrane which contains secreting glands, that in health secrete a small amount of fluid mucus to assist the air in passing in and out of the alveoli of the lungs without annoyance or friction. If, for any reason, as taking a sudden cold, this secretion is checked, the air passages become dry and inflamed, and produce a disagreeable sensation which patients sometimes call a smarting of the lungs. This state of dryness lasts usually but a short time, and is followed by a secretion many times more abundant than natural. This increased secretion, owing to inflammation of the mucous glands, is catarrhal in character, and acts as a constant irritation. It is often thick, yellowish in color, and raised with difficulty. A persistent cough is Nature's desperate remedy to expel the hardened, thick, offending mucus, just as if a bread crumb or some other foreign substance was in the windpipe. By fits of coughing Nature endeavors to obtain relief. This offending substance must be removed, and Nature has only two methods, one to throw it up by coughing, the other to absorb it into the circulation; the former method is much more desirable than the latter. When a catarrhal cold is yielding to treatment, the mucus becomes loose, is easily detached and readily expelled, all the symptoms become more favorable, and the cough less racking and severe. As the secretion is gradually reduced to the normal, the inflammation and irritation subside, the cough more and more disappears.

Great harm may be done by suppressing a cough when Nature is striving to free the air passages from an overload of mucous secretions. Giving opium or morphine, cough drops, troches, or any anodyne reme-

dies to a young child whose air passages are loaded with catarrhal *débris* is bad practice, and has cost many a little sufferer his life. In no instance must the cough be quieted in an infant suffering from catarrhal diseases, no matter how much the mother and others are annoyed by the persistent coughing. In capillary bronchitis the cough is the child's safety, and must not be suppressed, else the lungs will fill up and the child will die.

Coughs due to irritation and a dry inflammation of the bronchi may be safely quieted, and this can be done with positive benefit to the patient.

There is a great deal of character about a cough, and to the practised ear much information as to the cause and location of disease is conveyed.

The barking, ringing cough of spasmodic croup is readily recognized by any who have heard it once.

The dry, hacking cough occurs in the early stages of inflammatory disease and is a sign of obstruction in the respiratory region.

The stomach cough is caused by reflex action from a diseased or disordered stomach, and is not accompanied by expectoration.

The short, teasing cough denotes irritation of the throat. The disease is seldom deep seated.

The hoarse, smothered cough is indicative of obstruction in the larynx and is a serious symptom.

The cough of influenza is dry, irritative, persistent, and annoying.

The short, harsh, ringing cough of pneumonia is tight, and is suppressed by reason of the pain which accompanies it.

The spasmodic, paroxysmal, short, rapid cough of whooping cough, terminating in the deep, loud, crowing inspiration, from the sound of which the disease takes its name, is familiar. Vomiting frequently attends the violent and exhausting effort. Three such attacks form one series.

Expectoration.—The act of discharging mucus or other matter from the throat, lungs, or trachea, and the substances so discharged, are called the expectoration. The term in its first meaning is synonymous with coughing, and need not further occupy our attention; but, in its second sense, we find so many important considerations connected with the diagnosis of disease, that we must pause awhile to consider it. It is by the nature of the expectoration that the physician is enabled to judge of the character and progress of the malady with which he has to contend. If such expectoration is frothy, it indicates active bronchitis, catarrh, or influenza; if stringy, and of a whitish or yellowish color, the

bronchitis has become chronic, or spasmodic, or there may be whooping cough present, or impending; if purulent it may indicate the latter stages of catarrh or influenza, especially if the sputum, or matter expectorated, is mixed more or less with a tenacious mucus; genuine pus, capable of being poured from one vessel to another, indicates the bursting of an abscess in the lungs, or of pus from empyema, which has found its way into the bronchial passages; the yellow matter often expectorated in humid asthma is not truly purulent, but to a large extent mucous. If lumpy, there can be no mistake as to the nature of the disease; pulmonary consumption has fairly set in and made considerable advances; there is sure to be a softening and breaking up of tubercles, where there are small yellowish or whitish lumps expectorated along with a clearer fluid on which they float, perfectly distinct. If membranous, the sputum indicates inflammatory action of a chronic, most likely of a croupy, character. If stringy, and rusty colored, there is certainly pneumonia; if bloody, there is hemoptysis,—either a blood vessel of the lungs has broken, or blood has oozed through the bronchial membrane, both of which are symptoms indicative of great danger to the patient. If offensive and putrid, there may be gangrene of the lungs, but this is only a single sign of such condition and not to be relied on alone.

These are the distinctive characters which expectoration assumes; its increase or decrease in bulk or density, its varieties of tint, and other particular changes, tell to the experienced eye of the doctor how the case is progressing, and whether it is likely to terminate in convalescence or death.

The Skin.—The condition of the skin is indicative not only of the several diseases of the skin, but of eruptive, and other functional and constitutional diseases.

Symptoms of skin diseases are: heat, pain, smarting, tingling, burning, and itching.

Redness, heat, and burning are indications of ordinary chafing, such as occurs in infants and in very stout persons, on those parts of the body which rub against one another.

Very small puffy elevations of the skin accompanied by itching, burning, and prickling sensation denote hives.

Heat, swelling, redness, discharge, and crusting denote eczema.

German measles appears as an eruption of rose-colored spots of pinhead size, seen generally on the face at first, though it is often noticed earlier on the roof of the mouth. The eruption appears

from the first to the fourth day of attack and disappears within a week.

Measles shows itself as an eruption on the third or fourth day of attack, in the form of dark-red or purplish spots, of small size, first upon the face and then spreading over the body. Clear patches of skin are visible between the collections of spots. The eruption lasts about nine days. Behind the ears, on the forehead, and face are the first places to look for them.

Scarlet fever eruptions take the form of a bright scarlet rash which first appears on the chest and neck, and spreads rapidly over the entire body. The eruption is not raised, but is quite flat or even with the surface of the skin. It disappears on pressure and seldom lasts more than five days or a week.

Chicken pox shows distinct, scattered, slightly raised, flat spots some of which change to blisters. They come in successive crops and disappear in from three to five days. The eruption is accompanied by intense itching.

Erysipelas appears in the form of red spots which quickly run together and form a crimson or violet colored section, with a distinct border. There is swelling, tingling, heat, and tenderness.

The skin shows increased sensitiveness (hyperesthesia), decreased or absent sensitiveness (anesthesia), and perverted sensitiveness (paresthesia), in nervous diseases.

The Stomach.—The symptoms affecting the stomach are vomiting or nausea, flatulence, pain after eating, and, in some cases, eructations of a watery fluid, in large quantities.

Vomit.—Bilious vomit is of a greenish-yellow color owing to the presence of bile.

Black Vomit is characteristic of cholera and is composed of blood and the contents of the stomach.

Coffee ground vomit is composed of blood from the stomach mixed with the contents of the stomach, and occurs in forms of cancer of this organ.

Continuous vomiting is very serious by reason of its violence and long continuance. It often occurs in pregnancy.

Stercoraceous vomiting is that form in which some fæcal matter appears. It is a symptom of intestinal obstruction.

The Bowels present the following symptoms when disordered:—

Constipation may arise from torpor of the bowels, owing to long

continued neglect, or to the absence of suitable articles of diet, or from deficient secretion of the natural stimulus, the bile.

Diarrhœa consists in an increased discharge of liquid fæces, and may be caused by the irritation of food or medicine, or by the presence of hardened fæces; or sometimes from a poison disease, such as cholera.

The Fæces.—The fæces are the rejected residue of the food after it has served the purposes of nutrition. According to Berzelius, the normal constituents of the human fæces are as follows:—

Water	73.3
Vegetable and Animal Remains	7.0
Bile	0.9
Albumen	0.9
Peculiar Extractive Matter	2.7
Salts	1.2
Slimy Matter, consisting of Picromel, peculiar Animal Matter and Insoluble Residue	14.0

This is the composition of the fæces when the health is perfect, and there is nothing very peculiar in the diet to render it otherwise. In disease great changes take place, not only in the proportions, but even in the ingredients of which the fæces are composed. By the peculiarity of smell and color, the medical man is enabled to judge of the nature and progress of certain diseases; therefore it is of importance that the fæces should be preserved for his inspection. The following are a few of their most obvious indications:—

Natural fæces are of a gingerbread color, slightly varying in tint and hue, and of tolerable consistency, although perfectly impressible. The smell is offensive, but has not that peculiar fetidity observed in some diseased conditions of the system. The evacuations should be daily, and at, or near, a certain hour; but a deviation from this rule is no proof of ill health. Cases are known of perfectly healthy persons, who went to stool only once in two, three, or four days, or even in a week. It depends greatly upon habit, but the habit of infrequency is not good. Children should be taught to attend to this matter at a certain hour every day, and the habit of a daily evacuation of the bowels once fixed, will probably remain through life, except when it is interfered with by sickness, or the failing powers which are often consequent upon old age.

Mucous evacuations have a semi-transparent, jelly-like appearance. They may be tinged with brown, green, or yellow, all indicating the

presence of bile; or red with blood, when there is inflammation or congestion of the mucous membrane, as in mucous diarrhœa and dysentery. Evacuations may have a rough, shreddy, or spotty appearance. There may be little irregular round specks, like dirty white of egg, scattered through the fæces, or long pieces like shreds of lymph or dingy colored parchment. In such cases there may be acute inflammation of the mucous membrane of the intestines, situated in any part of the bowels or rectum.

Pus in the fæces indicates either ulceration of the bowels, or the breaking of an abcess into the alimentary canal. If there is much of it, the latter is most likely the case. This is a symptom of danger.

Bile in the fæces indicates excessive action of the liver, the cause of which may be irritation or active congestion,—in which case the color is generally of a yellowish brown, but sometimes, especially in children, it is of a decided green color. This, too, is often the case with grown persons, when the liver is just recovering from a torpid state and beginning to act somewhat violently. This is commonly the case, too, in hydrocephalus, when the color is a peculiarly deep green. Bilious motions may or may not be loose, although they are generally so, from the bile acting as an irritant to the lining of the bowels.

Absence of bile in the fæces is shown by absence of color. The motions are clayey, sometimes as pale as pipe clay, and ranging from that shade up to the natural hue, occasionally assuming a grayish tint. They vary in substance, and when liquid are usually frothy, and float upon water on account of the quantity of gas which they contain.

Loose bowels result from so many causes that we cannot take them as clear indications of any particular diseases. An irritated or inflamed state of the mucous membrane causes diarrhœa, in some stages of which the stools are fluid. If, in this state, there are rice water stools, it indicates Asiatic cholera, or the too powerful action of saline or drastic purgatives.

Hard, solid fæces, at unequal intervals, indicate constipation.

Offensive stools occur in some forms of dyspepsia. The fœtor is excessive in low fevers, when the poison introduced into the system seems to render the whole of the solids and fluids thereof peculiarly liable to decomposition.

The Urine.—The urine in a state of health is of an amber color, with a faint odor, slightly acid reaction, and a specific gravity of 1.018.

The average quantity voided in 24 hours is from 40 to 50 ounces, or from 2½ to 3 pints. A greater quantity than this is passed just after the crises of fevers, when the pores of the skin are closed by cold or a chill, in diabetes, and in other kidney diseases.

A less quantity is passed after excessive perspiration, in diarrhœa, congestion and inflammation of the kidneys, fever, and stricture and obstruction.

Color.—If the quantity is increased, the color is usually very light. If the amount is diminished, it is usually darker. A clouded appearance comes to nearly all normal urine on standing for a time. It is due to mucus.

Blood in the urine is a sign of congestion, inflammation, tumors, or injuries in the bladder or urethra. If it flows in the early part of the micturition, the urethra is affected; if at the latter part of the act, the bladder is involved. If mixed throughout, the kidneys are probably involved.

Pus in the urine indicates suppuration at some point in the urethra or bladder. Its occurrence during the early or late parts of micturition indicates the urethra or the bladder as the seat of the affection.

Brick-dust deposits in the urine indicate an excess of the urates which are increased in wasting diseases, gout, fever, malaria, scurvy, indigestion, etc.

Odor.—The odor of urine is changed by articles of food, such as asparagus, garlic, etc., and by such medicines as santonin.

Congestion of the Kidney.—The attention of the patient is called to this disorder by pain over the kidney running into the genital organs and by a constant desire to urinate; by headache and nausea. The urine is scanty and high colored. In acute Bright's disease, dropsy is an early symptom; puffiness of eyelids and swelling of lower extremities; the urine is reduced in quantity and looks like beef washings owing to the presence of blood in the urine.

In one form of chronic Bright's disease, increasing general debility, pallor of the countenance, a puffy, doughy face, and frequent passing of water call attention to the disease.

In another type of Bright's disease, disturbances of digestion and vision; decline of body-weight; the skin becoming hard and dry, and of a yellow-white color; nosebleed, headache, thirst, and frequent passing of water, indicate a disease of the kidneys, occurring commonly about middle life.

Dropsy.—The dropsy of heart disease begins about the ankles and feet and extends upward.

Dropsy due to kidney trouble begins in the face with puffiness of the lower eyelids, and extends downwards.

Dropsy due to liver trouble, or obstruction of circulation of blood in the liver region, begins in the abdomen.

Fluctuation.—This is an indication of the presence of pus in a swelling. It is produced by pressing on opposite sides or parts of the swelling with two or more fingers of each hand. If pus is present, there will be felt a flowing or fluctuating motion of pus under the touch.

Flatulency is a system of disordered stomach of a chronic character, as dyspepsia. Pain after eating is also a sign of indigestion or disordered stomach, but there is generally inflammation accompanying it.

The odor of the breath enables us in many instances to determine the presence of disease; and certain poisons impart a peculiar odor to the breath. A sour breath indicates disturbances of digestion. A sweetish breath is found in the later stages of diabetes. The odor of ammonia is frequently noticed in serious kidney disturbances, and in all fevers the breath has the characteristic feverish odor. In tonsilitis and in diseases of the mouth the breath is quite foul.

Phosphorus poisoning imparts to the breath the odor of garlic. Carbolic acid poisoning—if the poison has been administered by the mouth—imparts its well-known characteristic odor to the breath.

The odors of alcohol and tobacco on the breath are well known.

Seat of Pain.—The location of pain is often a guiding sign of the disease, though not infallible. For not infrequently the pain is felt in a region remote from that affected. Pain in the ear, for instance, may be caused by throat trouble, or an affection of the brain, quite as often as by a disease of the ear itself. The eye is often affected by nervous and brain troubles. It also swells and becomes puffed from dropsy, dependent upon kidney disease. The swelling of the ankles is often an indication of heart affections. Still there is no mistaking many of the diseases accompanied by pain when they are of a local nature.

Headache plays an important part in diagnosis for it is symptomatic of many diseases.

Pain in the angle of the jaw indicates tonsilitis. Higher up, at the hinge near the temple, when accompanied by swelling, it leads one to suggest mumps.

Soreness and difficulty in swallowing indicate throat affections.

Pain around the heart may be caused by heart disease, neuralgia, pleurisy, or abscess in that region.

The pain of neuralgia is sharp, stabbing, and comes in paroxysms. There is usually great tenderness felt all along the path of the nerve affected.

Neuralgic pains in the joints and muscles are symptoms of influenza.

Pain and tenderness over the stomach suggest gastric affections; over the bowels, increasing with pressure, indicate peritonitis.

Pains in the joints and limbs, increasing on motion and pressure, are signs of rheumatic diseases.

SOME COMMON DISEASES AND THEIR SYMPTOMS.

It is necessary for every mother, at least, to recognize some of the symptoms of the common diseases. It is not expected that the layman will be able each time to diagnose every disease correctly, but we all know that our mothers had a way of telling measles from whooping cough and biliousness from diphtheria. Mothers of large families often have an extensive experience in hospital work at home, and keen, observing, intelligent mothers often prove of valuable assistance to physicians by being able to early diagnose disease or locate cause of functional disturbances. We shall attempt in this article to give only a few of the common, early symptoms of the most common diseases. Their treatment will be left for another section.

Fevers.—A fever is the most general disease of the human race. It attacks all ages, sexes, and constitutions. Fevers may be divided into three classes, viz., continual, remitting, and intermitting. A continual fever is that which never leaves the patient during the whole course of the disease. Fever is called acute when its progress is quick and symptoms are violent; but, when these are more gentle, it is called slow. A remitting fever differs from a continual only in degree; it has frequent increases and decreases, but never wholly leaves the patient during the course of the disease. Intermitting fevers (agues) are those which, during the time the patient may be said to be ill, have evident intervals and abatements of the various symptoms.

Typhoid.—The early symptoms of typhoid are usually headache,

with general aching of the whole body, frequently chills and fever, accompanied by nervousness, even in people who appear to have no nerves. Often there will be slight hemorrhages from the nose or these may be copious and frequent. There is a loss of appetite with a desire to drink large quantities of water, the bowels move frequently and become tender to the touch, the tongue coated, and the eyes shiny. When such symptoms appear a physician should be consulted at once. It is sometimes difficult from clinical diagnosis to determine whether the case is typhoid or not, but the physician's test of the blood will usually prove the suspicion.

Pneumonia.—In case of sudden colds, attended by chills and followed by high temperature with flushed cheeks, pain in the chest, and a general tired feeling, watch out for pneumonia. Grip sometimes exhibits something of the same symptoms, and it, too, with its multitude of after complications, needs careful attention.

Measles are usually epidemic, and when in the vicinity one is on the lookout for symptoms to appear. Adults rarely have measles; if they have been fortunate enough to escape them in childhood or adolescence they are not likely to have them. However, escaping them in early life by no means makes one entirely immune, and when one is afflicted with this child's disease after reaching manhood or womanhood it is no simple matter. The early symptoms are like those of a sudden cold with headache and weariness. The eyes become red and the conjunctiva becomes blotched and inflamed. Usually a rash appears early, appearing first in the hollow of the arm, about the elbow, and around the waist.

It is sometimes difficult to tell the rash of measles from the rash of other diseases. Roseola in children much resembles measles to the inexperienced. This rash comes from indigestion or from fruit poisoning. The germs of measles form in crescent shaped colonies, which are clearly discernible when the rash first appears. Later when the features become swollen and the disease is at the height of its intensity, it is hard to decide whether it is measles, scarlet fever, or smallpox.

Scarlet Fever or canker rash is much like measles in form, and the early symptoms are very similar. Usually the temperature runs higher and the throat and mouth show patches of canker. Scarlet fever is a more serious disease, however, being almost sure to be followed by some complication and being more severe in its intensity. Among the complications we find bladder and kidney troubles, abscesses of the ear

which may destroy the hearing, inflammation of the eyes causing defective vision or blindness, and many others. This disease needs most careful nursing, skillful attention, and a closely watched convalescence.

Tonsilitis is a common disease in cold, damp climates, and is not given sufficient attention by most people. It is considered highly transmissible and every precaution should be taken to guard against infecting other members of the family. Towels, napkins, glasses, spoons, forks, etc., should be thoroughly scalded after being used by the patient, and care taken not to get the breath, which is of a foul nature. The early symptoms of tonsilitis are not readily recognized by people in general, especially in small children. There is a general expression of lassitude and a desire to sleep. The flesh is dry and hot, the face flushed and a tendency to peevishness. The eyes show dark rings and there is a general look of illness. Upon examination of the throat the condition is found to be dark red in color with perhaps a few white patches. This condition increases, the pulse becomes full and decided as the poison is absorbed.

Diphtheria is one of the most dreaded diseases and comes from a specific germ finding lodgment in a throat of delicate condition, fit field for its cultivation. The early symptoms are very like tonsilitis with an early appearance of the diphtheritic membrane on the tonsils and in the throat. Whenever diphtheria is even suspected, isolate the suspect till a physician has been consulted. This disease is too virulent in character to take any chances in spreading infection. In all cases where frequent sore throats are noticed in the family, careful inspection and disinfection should be made of the drains, closets, lavatories, cellars, cisterns, wells, cesspools, outhouses, or any place where disease germs are likely to be thriving. Do not wait till some member of the family is striken down with diphtheria or typhoid before these places are looked after. Take them in time. (See modes of disinfecting. Page 154.)

Jaundice is caused by a disarrangement of the liver or bile ducts, causing the skin to try to do their work by disposing of the bile through the pores, thus giving to the patient a yellow or lemon color.

Appendicitis is an acute inflammation of the appendix, which is situated below the liver in the right side of the abdomen, about 2½ inches below the short ribs. The pain is a griping, coiling, incisive one, which usually makes the patient writhe in intense agony.

LIST OF SYMPTOMS ARRANGED FOR READY REFERENCE.

Abdomen, Distended.—Chronic Catarrh of the Stomach. Chronic Dyspepsia. Drunkard's Dyspepsia. Chronic Alcoholism.

Abdomen, Distended and painful under pressure.—Poisoning by an irritating mineral acid.

Abdomen, Feeling of soreness and weight on the right side above the hip bone.—Appendicitis.

Abdomen, Hard and tense.—Colic or Gripes.

Abdomen, Hard and somewhat distended.—Intestinal Colic.

Abdomen, Pain in the.—Gallstones. Lead or Phosphorus Poisoning.

Abdomen, Burning and tearing pain in the.—Cholera Morbus.

Abdomen, Tense, hard, bloated, and severe cutting and boring pain in the.—Peritonitis.

Abdomen, Puffed out or drawn in.—Stomach Ache or Neuralgia of the Stomach. Gastralgia.

Abdomen, Sunken.—Cholera Infantum. Summer Diarrhœa.

Abdomen, Considerably swollen.—Dropsy.

Abdomen, Swollen and gives out a hollow sound when struck.—Peritonitis. Inflammation of the Bowels.

Abdomen, Tender.—Typhoid Fever.

Appetite, Capricious.—Dyspepsia. Indigestion. Heartburn. Diabetes Mellitus.

Appetite, Loss of.—Dysentery. Bronchitis. Pneumonia. Catarrh of the Stomach. Acute Indigestion. Ulcerated Stomach. Inflammation of the Stomach. Peritonitis. Jaundice. Congestion of the Liver. Biliousness. Catarrh of the Bladder. Inflammatory Rheumatism. Rheumatic Fever. Worms. Scarlet Fever. Influenza.

Belching.—Dyspepsia. Indigestion. Heartburn.

Blood Vessels, Hard, tortuous and sometimes bony.—Arterio-Sclerosis.

Blood Vessels, Stand out on face and forehead while coughing.—Whooping Cough.

Bowels, Desire to evacuate constantly.—Dysentery

Bowels, Desire to move but usually constipated.—Colic or Gripes.

Bowels, Irregularity of.—Dysentery.

Bowels, Gas in the.—Intestinal Indigestion. Colic.

Brain, Rupture of vessels.—Arterio-Sclerosis.

Breath, Bad.—Chronic Bronchitis. Acute Indigestion. Acute Catarrh of the Stomach. Scurvy in Children. Enlargement of the Tonsils. Intestinal Indigestion. Catarrh of the Head and Throat.

Breathing, Difficult.—Hay Fever or Hay Asthma. Heart Disease, Endocarditis. Dropsy. Chronic Bright's Disease. Poisoning by Ammonia. Poisoning by Iodine.

Breathing, Difficult and wheezing.—Asthma.

Breathing, Difficult and noisy.—Spasmodic Croup. Diphtheria.

Breathing, Difficult while coughing.—Whooping Cough.

Breathing, Irregular and rapid.—Hysteria. Malnutrition of Infants. Cholera Infantum or Summer Diarrhœa. Poisoning by Tainted Food.

Breathing, Irregular and slow.—Apoplexy or Hemorrhage of the Brain. Cerebro-Spinal Meningitis. Spotted Fever.

Breathing, Through the mouth.—Adenoid Growths. Tonsilitis. Quinsy. Enlargement of the Tonsils.

Breathing, Rapid.—Pneumonia. Neuralgia of the Heart or Angina Pectoris. Heat Stroke or Sunstroke. Acute Bronchitis.

Breathing, Rapid and shallow.—Pneumonia. Pleurisy. Peritonitis, or Inflammation of the Bowels.

Breathing, Slow and shallow.—Acute Inflammation of the Stomach. Convulsions.

Chest, Distress in the.—Congestion of the Lungs.

Chest, Fixed and immovable.—Neuralgia of the Heart or Angina Pectoris.

Chest, Fluid between lungs and chest-walls.—Pleurisy.

Chest, Irritation in the.—Asthma.

Chest, Lower part sunken in.—Pneumonia.

Chest, Movements decreased over affected parts.—Pleurisy.

Chest, Pain in the.—Bronchitis.

Chest, Sharp pain in one spot.—Pleurisy.

Chest, Crackling or squeaking sounds in the.—Pleurisy.

Chest, Crackling sounds in the, which cough does not change.—Pleurisy.

Chest, Dull sounds in the, which changes with the position.—Pleurisy.

Chest, Moist and bubbling sounds in the.—Acute Bronchitis.

Chest, Slight crackling or rattling sound in the.—Pneumonia.

Chest, Small and great bubbling sounds in the.—Pneumonia.

Chest. Rattling sound in the.—Bronchitis. Pneumonia.

Chest, Rough, rasping sound in the.—Membranous Croup.

Chest, Soreness in the.—Bronchitis.

Chest, Tenderness on pressure.—Pleurisy.

Chill.—Erysipelas. Malarial Fever. Consumption. Pleurisy. Inflammation of the Bowels. Cholera Morbus. Appendicitis. Tonsilitis. Quinsy. Scarlet Fever. Diphtheria. Influenza or La Grippe.

Chill, Followed by fever.—Typhoid Fever. Inflammatory Rheumatism. Rheumatic Fever. Peritonitis or Inflammation of the Bowels.

Chill, Slight.—Inflammation of the Bowels. Cholera Morbus.

Chill, Violent.—Smallpox. Pneumonia.

Circulation of the Blood, Poor.—Inanition of Infants. Malnutrition of Infants. Intestinal Indigestion.

Cold, Bad.—Measles.

Cold, Moderate.—Whooping Cough.

Cold in Nose and Head.—Acute Bronchitis.

Cold in Nose and Throat.—Acute Bronchitis.

Colic.—Poisoning with Sewer Gas. Cholera Morbus. Gallstones. Improper Feeding of Infants. Intestinal Colic. Chronic Constipation. Worms. Lead Poisoning. Copper Poisoning. Tainted Food Poisoning.

Colic, During digestion of food.—Peritonitis or Inflammation of the Bowels.

Colic.—Gallstones. Biliary Calculi.

Constipation.—Acute Bronchitis. Chronic Catarrh of the Stomach. Chronic Dyspepsia. Drunkard's Dyspepsia. Chronic Alcoholism. Dyspepsia. Indigestion. Heartburn. Colic or Gripes. Habitual or Chronic Constipation. Dropsy. Congestion of the Liver or Biliousness. Inflammatory Rheumatism. Rheumatic Fever. Diabetes Mellitus. Diabetes Insipidus. Rickets. Intestinal Indigestion. Appendicitis. Cerebro-Spinal Meningitis.

Convulsions.—Tumors of the Brain. Epilepsy. Cerebro-Spinal Meningitis. Whooping Cough. Poisoning.

Convulsions, Slight twitching.—Convulsions.

Convulsions, Violent.—Strychnine Poisoning.

Cough.—Hay Fever or Hay Asthma. Congestion of the Lungs. Pneumonia. Inflammation of the Throat. Typhoid Fever. Poisoning by Ammonia. Acute Pharyngitis. Acute Laryngitis.

Cough, Dry and hard.—Bronchitis.

Cough, Explosive.—Whooping Cough.

Cough, Hacking.—Congestion of the Lungs. Pleurisy. Consumption.

Cough, Hoarse and croupy.—Congestion of the Lungs. Spasmodic Croup. Membranous Croup.

Cough, Paroxysmal.—Whooping Cough.

Cough, Short.—Heart Disease. Endocarditis.

Cough, Tight.—Acute and Chronic Bronchitis.

Cough, with rust-colored expectoration.—Pneumonia.

Cramps in the Muscles.—Muscular Rheumatism.

Cramps in Thighs, Calves, Fingers, and Toes.—Cholera Morbus.

Cry, Low, distressed moan.—Cerebro-Spinal Meningitis.

Cry, Sharp and piercing.—Colic in Infants.

Cry, Single, peculiar.—Epilepsy.

Deafness.—Apoplexy. Congestion of the Brain. Typhoid Fever.

Deafness, Defect in hearing.—Tumors of the Brain.

Delirium.—Smallpox. Pneumonia. Diphtheria. Lead and Copper Poisoning, Tainted Meat Poisoning.

Delirium, with snakes, horrors, etc.—Delirium Tremens. Alcoholism. Erysipelas.

Delirium, with throwing hands and arms about the head.—Cerebro-Spinal Meningitis. Typhoid Fever. Influenza or La Grippe.

Depression.—Neuralgia of the Heart or Angina Pectoris. Acute Gastritis. Chronic Catarrh of the Stomach. Chronic Dyspepsia. Drunkard's Dyspepsia. Cystitis. Catarrh of the Bladder. Scurvy. Typhoid Fever.

Depression, Easily emotional and whimsical.—Hysteria.

Diarrhœa.—Erysipelas. Inflammation of the Bowels. Tonsilitis. Quinsy. Diarrhœa. Cholera Morbus. Summer Diarrhœa. Scarlet Fever. Typhoid Fever. Copper Poisoning. Mercury Poisoning. Poisonous Mushrooms. Tainted Food.

Diarrhœa, with purging.—Acute Inflammation of the Stomach or Gastritis. Inflammation of the Bowels.

Diarrhœa, Moderate.—Dysentery or Bloody Flux. Pneumonia. Jaundice. Acute Bright's Disease. Inanition in Infants. Inflammation of the Mouth in Infants.

Diarrhœa, Severe.—Dysentery or Bloody Flux.

Digestion, Disturbance of.—Erysipelas. Asthma. Pneumonia. Consumption. Chronic Catarrh of the Stomach. Chronic Dyspepsia. Drunkard's Dyspepsia. Alcoholism. Ulcer of the Stomach. Locomotor Ataxia. Tabes Dorsalis. Consumption of the Spinal Cord. Imperfect Nutrition of Infants.

Digestion, Indigestion.—Cancer of the Stomach. Dyspepsia. Indigestion. Heartburn. Hysteria. Typhoid Fever.

Dizziness, with faintness.—Stomach Ache. Gastralgia. Neuralgia of the Stomach. Congestion of the Brain. Apoplexy. Hemorrhage of the Brain. Tumors of the Brain. Hysteria. Nervous Prostration or Neurasthenia. Chronic Bright's Disease. Typhoid Fever. Poisoning by Carbolic Acid, by Copper, by Arsenic, by Illuminating Gas, by Coal Stove Gas, and by Belladonna.

Dropsy.—Dropsy. Acute Bright's Disease. Chronic Bright's Disease.

Drowsiness.—Dyspepsia. Indigestion. Heartburn. Measles. Influenza or La Grippe. Poisoning by Morphine, Opium, etc.

Ears, Pain in.—Earache.

Ears, Inflammation in.—Scarlet Fever.

Ears, Noises in the.—Congestion of the Brain. Delirium Tremens. Poisoning from Phosphorus.

Ears, Running from the.—Measles.

Eruptions, Blisters form on pimples and pus in blisters about the eighth day.—Smallpox.

Eruptions, Bright scarlet, tiny points; passing finger over rash leaves white line.—Scarlet Fever.

Eruptions, Coarse red spots appearing on the third day first on forehead and lips.—Smallpox.

Eruptions, Dark red spots appearing first on the ears and gradually spreading over the entire body.—Measles.

Eruptions, Small red pimples on a restricted part of the body, running together, containing a thick watery fluid, then crusting over.—Eczema.

Eruptions, Large irregular patches on face, from the size of a pinhead to that of a small pea, giving a feeling like small shot.—German Measles.

Eruptions, Pimples on scalp or face which spread slowly; become larger; have little blisters in them; blisters dry and form pits or hollow scars.—Chicken Pox.

Eruptions, Pus forms in pimples and fever is high.—Smallpox.

Eruptions, Red spots which run together, spread, and follow a chill.—Erysipelas.

Eruptions, Red spots form along the spine.—Cerebro-Spinal Meningitis or Spotted Fever.

Eruptions, Like flea-bites upon the abdomen, chest, and back.—Typhoid Fever.

Eruptions, Rose-colored on skin.—Poisoning by Iodine.

Eruptions on Face and Neck of Infants.—Sweat Rash.

Eruptions, Tiny bright red pimples very close together in hot weather, with tiny sac of watery fluid.—Prickly Heat.

Eruptions, Tiny eruption, intolerable itching.—Poison Ivy.

Expectoration, Bloody.—Inflammation of the Throat. Follicular Pharyngitis.

Expectoration, Brownish-red and yellow.—Pneumonia.

Expectoration, Cheesy.—Enlargement of the Tonsils.

Expectoration, Glairy mucus.—Consumption.

Expectoration, Rust-colored.—Pneumonia.

Expectoration, Slightly streaked with blood.—Congestion of the Lungs.

Expectoration, Thick, stringy, and yellowish.—Chronic Bronchitis.

Eyes, Bloodshot.—Smallpox. Congestion of the Lungs. Congestion of the Brain. Heat Stroke. Sunstroke. Inflammation of the Eyes of Newborn Infants. Nasal Catarrh. Measles. Poisoning by Iodine. Inflammation of the Conjunctiva. Pink Eye. Granulated Lids.

Eyes, Fixed stare for a moment.—Convulsions.

Eyes, Swollen lids.—Granulated Lids. Kidney Complaint.

Eyes, Sensitive to light.—Measles. Influenza or La Grippe.

Eyes, Pain in and around.—Pregnancy. Conjunctivitis. Granulated Lids. Neuralgia. Eye-strain.

Eyes, Pupils small.—Congestion of the Brain. Poisoning by Carbolic Acid, and by Morphine, Opium, etc.

Eyes, Pupils large.—Cerebro-Spinal Meningitis or Spotted Fever. Poisoning by Belladonna.

Eyes, Sunken.—Scurvy. Cholera Infantum or Summer Diarrhœa.

Eyes, Thick, creamy discharge with swollen lids.—Conjunctivitis. Inflammation of the Eyes of Newborn Infants. Pink Eye.

Eyes, Watery.—Asthma. Hay Fever or Hay Asthma. Measles. Influenza or La Grippe.

Eyes, Whites turned yellow.—Jaundice. Congestion of the Liver. Biliousness. Poisoning by Phosphorus.

Face, Anxious look.—Pleurisy.

Face, Rash or eruption on.—Eczema. Measles.

Face, Dark circles under eyes.—Scurvy. Intestinal Indigestion.

Face, Dull and stupid expression.—Adenoid Growths.

Face, Flushed and bathed in perspiration.—Asthma.

Face, Light yellow color.—Jaundice of Newborn Infants.

Face, Very pale.—Heat Stroke. Sunstroke. Chronic Bright's Disease. Scurvy. Membranous Croup. Convulsions. Epilepsy.

Face, Pinched features and sunken eyes.—Peritonitis.

Face, Pinched features, sunken eyes, evidence of pain.—Gallstones.

Face, Pinched look.—Dysentery. Bloody Flux. Acute Inflammation of the Stomach or Gastritis. Stomach Ache. Neuralgia of the Stomach, or Gastralgia. Colic or Gripes. Diabetes Mellitus. Cholera Infantum. Colic. Peritonitis, or Inflammation of the Bowels.

Face, Puffiness under the eyes.—Acute Bright's Disease.

Face, Puffy and swollen.—Acute Bright's Disease. Scurvy.

Face, Red and purple while coughing.—Whooping Cough.

Face, Red.—Smallpox. Pneumonia. Congestion of the Brain. Apoplexy. Hemorrhage of the Brain.

Faintness.—Stomach Ache, or Gastralgia, or Neuralgia of the Stomach. Congestion of the Brain. Apoplexy or Hemorrhage of the Brain. Tumors of the Brain. Hysteria. Nervous Prostration or Neurasthenia. Chronic Bright's Disease. Typhoid Fever. Poisoning by Carbolic Acid. Copper Poisoning. Arsenic Poisoning.

Feet and Legs, Swollen ankles.—Cancer of the Stomach. Dropsy.

Feet and Legs, Cold.—Stomach Ache, Gastralgia, or Neuralgia of the Stomach. Nervous Prostration or Neurasthenia. Inanition of Infants. Imperfect Nutrition. Cholera Infantum. Intestinal Indigestion. Peritonitis or Inflammation of the Bowels. Scarlet Fever.

Feet, Gangrene of.—Arterio-Sclerosis.

Feet and Legs, Numbness.—Locomotor Ataxia. Paralysis. Infantile Paralysis.

Feet, Legs, and Arms, Deformed.—Rickets.

Feet and Legs, Pain and soreness in the.—Congestion of the Liver or Biliousness. Locomotor Ataxia. Diabetes Mellitus.

Feet, Limbs jerk.—Congestion of the Brain.

Fever, Slight.—Smallpox. Dysentery. Malarial Fever. Fever and Ague. Intermittent Fever. Bronchitis. Pneumonia. Consumption. Acute Catarrh of the Stomach. Acute Indigestion. In-

flammation of the Bowels. Appendicitis. Peritonitis. Jaundice. Congestion of the Liver. Biliousness. Acute Bright's Disease. Catarrh of the Bladder. Pleurisy. Measles. Chicken Pox. Mumps. Diphtheria.

Fever, High.—Smallpox. Erysipelas. Malarial Fever. Intermittent Fever. Fever and Ague. Pneumonia. Inflammation of the Throat. Tonsilitis. Quinsy. Cholera Infantum. Peritonitis. Cerebro-Spinal Meningitis. Scarlet Fever. Measles. Typhoid Fever. Influenza or La Grippe.

Fever, Secondary.—Smallpox.

Gas in Intestines and Bowels.—Intestinal Indigestion. Colic. Worms. Typhoid Fever. Indigestion.

Gums, Swollen and bleed easily.—Scurvy. Inflammation of the Mouth. Stomatitis. Ulcerated Sore Mouth.

Hands, Cold.—Stomach Ache. Gastralgia. Neuralgia of the Stomach. Nervous Prostration or Neurasthenia. Inanition of Infants. Imperfect Nutrition. Cholera Infantum. Intestinal Indigestion. Peritonitis. Scarlet Fever.

Hands and Arms, Deformed.—Rickets. Rheumatism of the Joints.

Hands, Imperfect use of.—Locomotor Ataxia. Paralysis.

Hands and Arms, Thrown about the head.—Cerebro-Spinal Meningitis. Spotted Fever. Typhoid Fever.

Hard Palate covered with red spots.—Scarlet Fever. Measles.

Head, Rush of blood to the.—Congestion of the Brain. Apoplexy.

Headache.—Smallpox. Malarial Fever. Intermittent Fever. Fever and Ague. Pneumonia. Acute Catarrh of the Stomach. Acute Indigestion. Dyspepsia. Heartburn. Congestion of the Liver. Biliousness. Neuralgia. Sick Headache. Chronic Headache. Congestion of the Brain. Apoplexy. Nervous Prostration. Neurasthenia. Bright's Disease. Diabetes Insipidus. Pneumonia. Pleurisy. Eye-strain. Constipation. Nervousness. Rheumatism. Cerebro-Spinal Meningitis. Measles. Mumps. Diphtheria. Typhoid Fever. Influenza or La Grippe. Poisoning by Carbolic Acid. Poisoning by Iodine. Poisoning by Arsenic. Poisoning by Belladonna. Poisoning by Morphine or Opium. Poisoning by Tainted Food, Poisonous Mushrooms, etc.

Headache, Constant and gradually growing worse.—Tumors of the Brain.

Heart, Disturbance of action of.—Consumption. Dropsy. Pleurisy. Tobacco Poisoning.

Heart, Distress around the.—Inflammation of the Membrane of the Heart. Endocarditis.

Heart, Palpitation of the.—Asthma. Dyspepsia. Indigestion. Heartburn. Hysteria. Nervous Prostration or Neurasthenia. Chronic Bright's Disease. Scurvy.

Heart, Severe pain in the.—Neuralgia of the Heart or Angina Pectoris.

Heart, Weak action of the.—Poisoning by Arsenic.

Heartburn.—Acute Catarrh of the Stomach. Acute Indigestion. Dyspepsia. Indigestion. Heartburn.

Heat, Flashes of.—Acute Catarrh of the Stomach. Acute Indigestion.

Hemorrhage from Bowels.—Hemorrhoids or Piles. Scurvy. Habitual Constipation. Dysentery or Bloody Flux.

Hemorrhage from Lungs.—Consumption. Hemoptysis or Bleeding from the Lungs.

Hemorrhage from the Nose.—Epistaxis or Nosebleed. Whooping Cough. Diphtheria. Typhoid Fever. Dry Catarrh.

Hemorrhage from the Mouth.—Scurvy.

Hemorrhage from the Stomach.—Scurvy. Hematemesis or Vomiting of Blood.

Hemorrhage of the Uterus.—Uterine Hemorrhage. Labor.

Hiccough.—Peritonitis. Hysteria.

Inflammation around the Anus.—Hemorrhoids or Piles.

Inflammation of the Bowels.—Peritonitis.

Inflammation of the Covering of the Lungs.—Pleurisy.

Inflammation of the Ears.—Scarlet Fever.

Inflammation of the Mouth and Throat.—Influenza or La Grippe. Poisoning by Ammonia.

Inflammation of the Tonsils.—Tonsilitis. Quinsy.

Joints, Pain and stiffness in.—Inflammatory Rheumatism.

Joints, Swelling around the.—Scurvy. Rickets. Cerebro-Spinal Meningitis.

Kidneys and Bladder, Pain near.—Locomotor Ataxia. Acute Bright's Disease. Diabetes Mellitus. Spasm of the Bladder. Stone in the Bladder. Scarlet Fever.

Lassitude.—Poisoning by Sewer Gas. Bad Ventilation. Malarial Fever. Intermittent Fever. Acute Bronchitis. Inflammation of the Bowels. Congestion of the Liver. Biliousness. Nervous

Prostration or Neurasthenia. Scurvy. Diabetes Mellitus. Measles.

Lips, Blue.—Malarial Fever. Intermittent Fever. Spasmodic Croup. Convulsions.

Lips, Pale.—Scurvy. Worms.

Lips, Dry.—Eczema. Pneumonia. Influenza or La Grippe.

Lips, Sore and cracked.—Pneumonia. Diphtheria.

Liver, Pain in region of.—Gallstones. Congestion of the Liver. Biliousness. Poisoning by Phosphorus.

Lungs, Bleeding from.—Hemoptysis.

Lungs, Congested.—Acute Endocarditis.

Memory, Confused.—Epilepsy.

Memory, Poor.—Dyspepsia. Indigestion. Heartburn. Locomotor Ataxia. Nervous Prostration or Neurasthenia. Diabetes Insipidus.

Mind, Confused.—Epilepsy.

Mind, Disturbed by fancies.—Poisoning by Belladonna. Delirium.

Mind, Irritable and weak.—Nervous Prostration.

Mouth, Bad taste in.—Acute Catarrh of the Stomach. Acute Indigestion.

Mouth, Breathing through.—Tonsilitis. Quinsy. Adenoids.

Mouth, Dry.—Mumps. Poisoning by Tainted Food.

Mouth, Discharge from.—Diphtheria.

Mouth, Inflamed.—Inflammation of the Mouth. Stomatitis. Poisoning.

Mouth, Taste of copper or metal in.—Mercury and Copper Poisoning.

Muscles, Shrinking of.—Paralysis.

Muscles, Flabby.—Scurvy. Rickets. Intestinal Indigestion.

Muscles, Twitching of.—Convulsions. Epilepsy. St. Vitus's Dance. Poisoning by Strychnine or by Aconite.

Muscles, Pain in.—Muscular Rheumatism.

Muscles, Weak.—Diphtheria. Typhoid Fever.

Nails, Blue.—Malarial Fever. Intermittent Fever. Fever and Ague.

Nausea, Slight.—Dysentery or Bloody Flux. Malarial Fever. Intermittent Fever. Fever and Ague. Inflammation of the Bowels. Peritonitis. Jaundice. Congestion of the Liver. Biliousness. Tumors of the Brain. Bright's Disease. Typhoid Fever.

Nausea, Severe.—Acute Catarrh of the Stomach. Acute Gastritis. Inflammation of the Stomach.

Nervousness.—Hysteria. Nervous Prostration. Neurasthenia. Diabetes Mellitus. Intestinal Indigestion. Typhoid Fever.

Night Sweats.—Consumption. Typhoid Fever.

Nose, Discharge from the.—Asthma. Hay Fever or Hay Asthma. Abscess in the Throat. Adenoid Growths. Nasal Catarrh. Spasmodic Croup. Measles. Diphtheria. Influenza or La Grippe.

Nosebleed.—Erysipelas. Pneumonia. Whooping Cough. Diphtheria. Typhoid Fever. Epistaxis. Dry Catarrh.

Nose, Talking through the.—Adenoid Growths.

Nose, Stoppage in the.—Nasal Catarrh.

Numbness.—Hysteria. Poisoning by Copper.

Numbness of the Feet.—Locomotor Ataxia.

Numbness of Finger Tips.—Poisoning by Oxalic Acid.

Odor to Breath.—Acute Catarrh of the Stomach. Acute Indigestion. Cancer of the Stomach, Scurvy, Indigestion in the Intestines.

Odor to Stools, Disagreeable.—Cholera Infantum. Summer Diarrhœa. Indigestion in the Intestines. Typhoid Fever.

Odor to Urine, Sweetish.—Diabetes Mellitus.

Odor, Peculiar about sick person.—Smallpox.

Pain in the Bladder.—Catarrh of the Bladder.

Pain in the Joints.—Rheumatism.

Pain in the Course of the Nerves.—Neuralgia.

Pain in the Rectum with Burning.—Dysentery. Piles or Hemorrhoids.

Pain in the Pit of the Stomach.—Chronic Catarrh of the Stomach. Chronic Dyspepsia. Drunkard's Dyspepsia.

Pain, Cutting, tearing, twisting, and pinching, over the abdomen.—Colic or Gripes.

Pain, Colicky.—Dysentery. Stomach Ache or Gastralgia. Colic or Gripes.

Pain, Dull, in back and over kidneys.—Acute Bright's Disease.

Pain in the Abdomen.—Smallpox. Jaundice. Peritonitis or Inflammation of the Bowels. Lead Poisoning. Phosphorus Poisoning. Poisonous Food.

Pain in the Back.—Smallpox. Ulcer of the Stomach. Diabetes Mellitus. Inflammation of the Tonsils. Quinsy. Cerebro-Spinal Meningitis. Spotted Fever. Measles. Mumps.

Pain in the Bowels.—Dysentery.

Pain in the entire Body.—Acute Bronchitis. Pneumonia. Influenza.

Pain in the Chest.—Acute Bronchitis.

Pain in the Ears.—Earache. Scarlet Fever.

Pain in and about the Eyes.—Hyeropia. Far-sightedness.

Pain in the Limbs.—Locomotor Ataxia.

Pain in the Heart, Intense, sickening.—Neuralgia of the Heart or Angina Pectoris.

Pain in the Lungs.—Pleurisy.

Pain in the Muscles.—Inflammation of the Tonsils. Quinsy. Muscular Rheumatism.

Pain in the Side.—Pleurisy. Appendicitis.

Pain, Sudden, Piercing in the region of the liver.—Gallstones.

Pain upon Swallowing.—Diseases of the Upper Part of the Throat.

Paralysis.—Infantile Paralysis. Apoplexy. Hemorrhage of the Brain. Locomotor Ataxia. Tabes Dorsalis. Consumption of the Spinal Cord. Copper, Blue Vitriol, Verdigris Poisoning.

Paralysis of the Vocal Cords.—Tumors of the Brain.

Paralysis, Sudden, of any part of the body.—Hysteria.

Paralysis, Sensations blunted.—Infantile Paralysis.

Perspiration, Clammy.—Cholera Morbus.

Perspiration, Gentle, soft.—Gastralgia. Stomach Ache.

Perspiration on Head.—Rickets.

Perspiration, Profuse at night.—Typhoid Fever.

Pits.—Smallpox.

Pot-belly.—Rickets.

Prostration, Marked.—Lobar Pneumonia. Tuberculosis. Consumption. Heat Stroke. Sunstroke.

Pulse, Strong and rapid.—Smallpox. Acute Bronchitis. Malarial Fever. Intermittent Fever. Fever and Ague. Swamp Fever. Congestion of the Lungs. Lobar Pneumonia. Acute Bright's Disease. Membranous Croup. Pneumonia. Lung Fever.

Pulse, Weak and rapid.—Dysentery. Bloody Flux. Broncho-Pneumonia. Acute Gastritis. Heat Stroke. Sunstroke. Cholera Infantum. Summer Diarrhœa. Peritonitis. Inflammation of the Bowels. Scarlet Fever. Diphtheria. Influenza or La Grippe. Sulphuric Acid Poisoning. Hydrochloric Acid or Nitric Acid Poisoning. Saltpeter Poisoning. Phosphorus Poisoning. Strychnine, Morphine, and Opium Poisoning.

Pulse, Slow.—Apoplexy. Nicotine (Tobacco) Poisoning.

Pulse, Hard and tense.—Arterio-Sclerosis. Colic. Gripes. Peritonitis.

Pulse, Irregular.—Arterio-Sclerosis. Gastralgia. Stomach Ache.
Purging.—Cholera Morbus.
Restlessness.—Erysipelas. St. Anthony's Fire. Rickets. Peritonitis. Inflammation of the Bowels.
Restlessness, at night.—Rickets. Cerebro-Spinal Meningitis. Spotted Fever.
Restlessness and Fretfulness.—Cholera Infantum. Summer Diarrhœa. Indigestion in the Intestines. Peritonitis. Inflammation of the Bowels.
Scabs and Crusts.—Smallpox. Eczema. Seborrhea. Prickly Heat. Chicken Pox.
Sight, Interfered with.—Locomotor Ataxia. Tabes Dorsalis. Consumption of the Spinal Cord. Congestion of the Brain. Tumors of the Brain. Delirium Tremens. Heat Stroke. Sunstroke. Chronic Bright's Disease. Influenza or La Grippe. Nicotine (Tobacco) Poisoning.
Sight, Flashes of light.—Congestion of the Brain.
Sight, Floating spots before the eyes.—Illuminating Gas Poisoning.
Skin, Blue.—Iodine Poisoning. Arsenic Poisoning. Illuminating Gas and Coal Stove Gas Poisoning.
Skin, Cold and clammy.—Acute Gastritis. Colic. Gripes. Cholera Morbus. Heat Stroke. Sunstroke. Diseases dependent upon Food and Feeding. Cholera Infantum. Summer Diarrhœa. Membranous Croup.
Skin, Cold.—Colic. Gripes. Peritonitis. Gallstones. Heat Stroke. Sunstroke. Saltpeter Poisoning.
Skin, Cool and rough.—Dysentery. Bloody Flux.
Skin, Covered with rash.—Scarlet Fever. Measles. Chicken Pox. Belladonna (Atropine—Nightshade) Poisoning. Tainted Meat Poisoning. Fish, Mussels, Cheese, and Milk Poisoning.
Skin, Dry, harsh, and itchy.—Jaundice. Measles.
Skin, Goose-flesh appearance.—Malarial Fever. Intermittent Fever. Fever and Ague. Swamp Fever.
Skin, Hot and dry.—Acute Bronchitis. Sunstroke. Acute Bright's Disease. Diabetes Insipidus. Pneumonia. Lung Fever.
Skin, Irregular about blood vessels.—Arterio-Sclerosis.
Skin, Muddy color.—Congestion of the Liver. Biliousness. Scurvy. Indigestion in the Intestines.
Skin, Pale.—Malarial Fever. Intermittent Fever. Fever and Ague.

Swamp Fever. Tuberculosis. Consumption. Cancer of the Stomach. Diseases dependent upon Food and Feeding. Scurvy. Chronic Enlargement of the Tonsils. Cholera Infantum. Summer Diarrhœa. Indigestion in the Intestines. Typhoid Fever.

Skin, Red, irritated and swollen.—Poison Ivy.

Skin, Scales off.—Erysipelas. St. Anthony's Fire. Measles.

Skin, Sensitive.—Neuralgia.

Skin, Yellow color.—Jaundice in Diseases of the Newborn Child.

Sleeplessness.—Smallpox. Erysipelas. St. Anthony's Fire. Lobar Pneumonia. Chronic Catarrh of the Stomach. Chronic Dyspepsia. Drunkard's Dyspepsia. Dyspepsia. Indigestion. Heartburn. Delirium Tremens. Alcoholism. Nervous Prostration. Cystitis. Catarrh of the Bladder. Imperfect Nutrition. Difficult Teething. Indigestion in the Intestines. Colic.

Sleeplessness.—Typhoid Fever. Nicotine (Tobacco) Poisoning.

Sneezing.—Hay Fever. Nasal Catarrh. Measles.

Snoring.—Chronic Enlargement of the Tonsils.

Stomach, Bleeding from.—Hematemesis. Vomiting of Blood.

Stomach, Bloated.—Gastralgia. Stomach Ache. Acute Indigestion in the Stomach.

Stomach, Burning feeling in the.—Acute Gastritis. Ulcer of the Stomach.

Stomach, Distress in and about the.—Erysipelas. St. Anthony's Fire. Acute Catarrh of the Stomach. Acute Indigestion. Ulcer of the Stomach. Cancer of the Stomach. Dyspepsia. Indigestion. Heartburn. Cholera Morbus. Jaundice. Acute Indigestion in the Stomach. Phosphorus Poisoning. Arsenic Poisoning. Tainted Sausages Poisoning.

Stomach, Gas in.—Acute Catarrh of the Stomach. Acute Indigestion. Dyspepsia. Indigestion. Heartburn.

Stomach, Heaviness.—Acute Catarrh of the Stomach. Acute Indigestion. Cancer of the Stomach. Acute Indigestion in the Stomach.

Stomach, Sour.—Cancer of the Stomach.

Stools, Bloody.—Dysentery. Bloody Flux. Hemorrhoids. Piles. Chronic Constipation. Copper, Blue Vitrol, Verdigris Poisoning.

Stools, Dry.—Diabetes Mellitus.

Stools, Disagreeable odor.—Cholera Infantum. Summer Diarrhœa. Indigestion in the Intestines. Typhoid Fever.

Stools, Frequent.—Cholera Infantum. Summer Diarrhœa. Typhoid Fever.

Stools, Pale.—Diabetes Mellitus. Indigestion in the Intestines.

Stools, Undigested food in.—Acute Indigestion in the Stomach.

Stools, Watery.—Inflammation of the Bowels. Cholera Morbus. Cholera Infantum. Summer Diarrhœa.

Swallowing, Difficulty in.—Thrush. Diseases of the Upper Part of the Throat. Inflammation of Tonsils. Quinsy. Measles.

Swelling of Ankles, Legs, or Abdomen.—Tuberculosis. Consumption. Gastralgia. Stomach Ache. Dropsy. Acute Bright's Disease.

Swelling of the Eyelids.—Trachoma. Granulated Lids.

Swelling of the Face.—Smallpox. Acute Bright's Disease. Mumps.

Swelling of the Jaw.—Mumps.

Swelling of the Joints.—Appendicitis. Muscular Rheumatism. Scurvy. Cerebro-Spinal Meningitis. Spotted Fever.

Swelling of the Skin.—Erysipelas. St. Anthony's Fire. Poison Ivy.

Teeth become loose.—Scurvy.

Teeth, Chatter.—Malarial Fever. Intermittent Fever. Fever and Ague. Swamp Fever.

Teeth, Grind.—Indigestion in the Intestines. Round Worm.

Thirst, Intense.—Chronic Catarrh of the Stomach. Chronic Dyspepsia. Drunkard's Dyspepsia. Cholera Morbus. Inflammatory Rheumatism. Acute Articular Rheumatism. Diabetes Mellitus. Cholera Infantum. Summer Diarrhœa. Belladonna (Atropine—Nightshade) Poisoning. Malarial Fever. Swamp Fever. Fever and Ague.

Thirst, Moderate.—Acute Bronchitis.

Throat, Dryness of the.—Acute Gastritis. Diseases of the Upper Part of the Throat. Belladonna (Atropine—Nightshade) Poisoning.

Throat, Deposit in the.—Diphtheria. Chronic Catarrh of the Throat. Chronic Pharyngitis.

Throat, Foreign bodies in the.—Foreign Bodies in the Air Passages.

Throat, Feeling, as of ball in.—Hysteria.

Throat, Hoarseness.—Acute Laryngitis. Chronic Laryngitis.

Throat, Inflamed.—Scarlet Fever. Diphtheria. Influenza or La Grippe. Sulphuric Acid and Mercury. Corrosive Sublimate Poisoning. Acute Catarrh of the Throat. Acute Pharyngitis. Chronic Catarrh of Throat. Chronic Pharyngitis.

Throat, Raw.—Chronic Catarrh of the Throat. Chronic Pharyngitis.

Throat, Rattling in the.—Epilepsy.

Throat, Spasms in the.—Membranous Croup.

Throat, Sore.—Scarlet Fever. Measles. Diphtheria. Iodine Poisoning. Acute Catarrh of the Throat. Acute Pharyngitis.

Throat, Tonsils swollen.—Diseases of the Upper Part of the Throat. Inflammation of the Tonsils. Quinsy.

Throat, White and looks burned.—Carbolic Acid Poisoning.

Tongue, Coated.—Erysipelas. St. Anthony's Fire. Dysentery. Bloody Flux. Acute Catarrh of th Stomach. Acute Indigestion. Jaundice. Congestion of the Liver. Biliousness. Inflammation of the Mouth. Thrush. Acute Indigestion in the Stomach. Cholera Infântum. Summer Diarrhœa. Indigestion in the Intestines. Cerebro-Spinal Meningitis. Spotted Fever. Typhoid Fever. Influenza or La Grippe.

Tongue covered with small white spots.—Thrush.

Tongue, Dry.—Diphtheria.

Tongue, Edges red.—Inflammation of the Mouth.

Tongue, Swollen.—Inflammation of the Mouth.

Tumors in Abdomen on Right Side over Hip.—Appendicitis.

Tumors of Brain.—Delirium Tremens. Alcoholism.

Tumors, Protruding from Anus.—Hemorrhoids. Piles.

Ulcers.—Inflammation of the Mouth.

Ulcers in Stomach.—Ulcers of the Stomach.

Unconsciousness.—Heat Stroke. Sunstroke. Convulsions. Illuminating Gas. Coal Stove Gas Poisoning.

Urine, Blood in the.—Hematuria. Blood in the Urine. Poisonous Mushrooms.

Urine, Frequent desire.—Acute Bright's Disease. Cystitis. Catarrh of the Bladder. Diabetes Mellitus. Diabetes Insipidus.

Urine, Heavy and dark color.—Jaundice. Acute Bright's Disease. Cystitis. Catarrh of the Bladder. Carbolic Acid Poisoning.

Urine, Lack of control of.—Enuresis. Bed Wetting.

Urine, Large amount of.—Diabetes Mellitus. Diabetes Insipidus.

Urine, Pale and watery.—Diabetes Mellitus. Diabetes Insipidus.

Urine, Scanty.—Malarial Fever. Intermittent Fever. Fever and Ague. Swamp Fever. Acute Catarrh of the Stomach. Acute Indigestion. Dropsy.

Urine, Scanty and highly colored.—Dysentery. Bloody Flux. Lobar Pneumonia. Broncho-Pneumonia. Chronic Catarrh of the Stomach. Chronic Dyspepsia. Drunkard's Dyspepsia. Dyspepsia. Indigestion. Heartburn. Congestion of the Liver. Bilious-

ness. Acute Bright's Disease. Chronic Bright's Disease. Inflammatory Rheumatism. Acute Articular Rheumatism. Scurvy. Pneumonia. Lung Fever.

Veins, Stand out clearly.—Acute Endocarditis.

Voice, Affected.—Heat Stroke. Sunstroke. Chronic Enlargement of the Tonsils. Chronic Laryngitis.

Voice, Hoarse.—Dysentery. Bloody Flux. Membranous Croup. Acute Laryngitis. Chronic Laryngitis.

Voice, Loss of.—Diphtheria.

Voice, Nasal.—Abscesses and Adenoids. Nasal Catarrh.

Vomiting.—Smallpox. Chronic Bronchitis. Lobar Pneumonia. Chronic Catarrh of the Stomach. Chronic Dyspepsia. Drunkard's Dyspepsia. Cancer of the Stomach. Colic. Gripes. Cholera Morbus. Peritonitis. Jaundice. Gallstones. Biliary Calculi. Apoplexy. Hemorrhage of the Brain. Tumors of the Brain. Acute Bright's Disease. Chronic Bright's Disease. Diseases of the Upper Part of the Throat. Diseases of the Stomach. Acute Indigestion in the Stomach. Indigestion in the Intestines. Appendicitis. Peritonitis. Inflammation of the Bowels. Cerebro-Spinal Meningitis. Spotted Fever. Scarlet Fever. Mumps. Diphtheria. Influenza or La Grippe. Carbolic Acid Poisoning. Saltpeter Poisoning. Iodine Poisoning. Lead Poisoning. Copper, Blue Vitriol, Verdigris Poisoning. Mercury, Corrosive Sublimate Poisoning. Poisonous Mushrooms. Tainted Sausages, Tainted Meat, Fish, Mussels, Cheese, and Milk Poisoning. Poison Ivy.

Vomiting, Acid and bitter.—Acute Catarrh of the Stomach. Acute Indigestion.

Vomiting after Coughing.—Whooping Cough.

Vomiting, Black lumps.—Sulphuric Acid Poisoning.

Vomiting, "Coffee ground."—Ulcer of the Stomach.

Vomiting, Greenish matter.—Cholera Infantum. Summer Diarrhœa. Copper, Blue Vitriol, Verdigris Poisoning.

Vomiting of Blood.—Acute Gastritis. Ulcer of the Stomach.

Vomiting of Curds.—Artificial Feeding.

Vomiting caused by any sort of Liquid.—Cholera Morbus.

Vomit smells of Phosphorus.—Phosphorus Poisoning.

DISEASE	INCUBATION PERIOD	MODE OF ONSET	ERUPTION APPEARS	CHARACTER OF ERUPTION	ERUPTION DISAPPEARS	HOW LONG CONTAGIOUS
Scarlatina (Scarlet Fever)	1-4 days	sudden; often at night; vomiting; sore throat; high fever; in severe cases convulsions; conjunctivæ unaffected	end of 1st or during 2d day; on chest and neck first	dusky or light-red; often diffused; consists of numerous red points which coalesce to form a flush	in 3-5 days; first where it appeared first; generally copious desquamation, in shreds	so long as desquamation, ear discharge or abscess present; danger indefinitely in clothing, etc., not well disinfected
Rubeola (Measles; Morbilli)	8-10 days	rather sudden; catarrhal symptoms, particularly of the eyes; moderate fever	4th day; sometimes on 3d or 5th; first on forehead and behind ears	red dots like flea bites; crescentic; thickly about mouth and forehead	in about 4 days	for a week or more after eruption
Rubella (Rotheln; German Measles)	2-3 weeks	gradual; fever slight or wanting	usually first symptom; on face, forehead, and behind ears	like rubeola, but less distinct	in 4-6 days, without desquamation	unknown
Variola (Smallpox)	usually 10-14 days	sudden; chill; high fever; headache; pain in loins, etc.	3d or 4th day; fully formed pustules on 6th-9th day	red spots; becoming successively pimples, vesicles, and pustules	desiccation at end of 2d week; crusts slowly separate, leaving pits	so long as scabs re-form; indefinitely in fomites, etc.
Varioloid (Modified Smallpox)	10-14 days	sudden; chill; high fever; headache; pain in loins, etc.	3d or 4th day, on face, scalp, and arms; fully formed pustules on 6th-9th day	like variola, but less distinct	vesicles dry up on 5th-9th day of disease, without suppuration	so long as crusts re-form; indefinitely in fomites etc.
Varicella (Chicken Pox)	usually about 2 weeks	sudden; slight symptoms, sometimes none	within 24 hours; often in successive crops	pink pimples, becoming vesicles; first about nose	in 3 or 4 days, drying up without suppuration	till shedding of dried crusts
Typhoid Fever (Typhus Abdominalis)	10-14 days	gradual; sometimes sudden	7th-14th day	pink spots; few in number	variable	through disease; danger in stools

COMPARATIVE TABLE OF SYMPTOMS IN EPILEPSY, ETC.

SIGNS	EPILEPSY	HYSTERIA	URÆMIA	PETIT MAL	ALCOHOLIC EPILEPSY	TETANUS	SYNCOPE
Apparent cause	none	emotion	none	none	none	none	mental shock
Aura or prodromata	generally present, but short	globus hystericus; palpitation; choking	headache; vomiting; and dyspepsia	faintness and dimness of vision	tremors	nervousness	not so well defined as in epilepsy
Onset	sudden	often gradual	often gradual	sudden	sudden or gradual	gradual, begins in jaw	sudden or gradual
Scream	at onset and sudden	during attack	frequently none	frequently none	may or may not be present	none	none
Convulsion	first tonic, then clonic	rigidity more pronounced with more aching	rigidity generally absent	no rigidity	movements more clonic than tonic	always tonic	none
Biting	tongue	tongue; lips; and hands	tongue	none	rarely	none	none
Micturition	frequent	never	never	rarely, except when bladder is affected	rarely	sometimes	never
Defecation	occasionally	never	never	never	rarely	rarely	never
Talking	never	frequent	muttering	never	never	never	none
Duration	a few minutes	generally many minutes	from a minute to hours	momentary	may be prolonged	hours	indefinite time
Consciousness	lost	generally preserved	lost	not lost always, but clouded	lost	preserved	lost
Termination	spontaneous	may be induced by shock	spontaneous	spontaneous	spontaneous	spontaneous	gradual, with no somnolence

BOOK III.

MODERN NURSING AND CARE OF THE SICK.

HOME NURSING.

G. FREDERIC WHEELER.
Mills Training School for Nurses, Expert Nurse and Masseur.

The time has arrived when the value of skillful nursing is appreciated in every home. We no longer dare trust our sick ones in the hands of incompetent, unskilled, although well-meaning, attendants. The self-instituted nurse, with no knowledge of her calling, has been supplanted by an intelligent class of men and women who have especially prepared themselves for the work. In this class the medical profession realize a valuable adjunct to the fraternity, and are beginning to feel that their assistance and coöperation are indispensable, and almost essential, to the recovery of the patient. At best the physican can spend but a few moments each day in a single sick room, and the remaining hours must be given over to the care and superintendence of some other person.

It is not always an easy matter to secure a trained nurse, and many families cannot afford to engage one, for skilled service is expensive. This, however, should not prevent the sick from having excellent attention. It is to this end that these articles on "Home Nursing" are written, trusting that, with careful study and intelligent application of the principles set forth, the sick may enjoy better care in their helpless suffering.

Every family should have some member whom it can call nurse, one who will study the requirements of a sick room and strive to become proficient in this noble work. The entire care of the family illness should not devolve upon the already overworked mother. There must be some son or daughter in every family who will be able and willing to share this work or take the entire charge of the home hospital, one who is willing to prepare to discharge the duties in an efficient manner. No profession is more ennobling, and there is no way in which one can do more good in the world than to make himself proficiently able to take a watch at the bedside, and do it in such a way as to demand trust from both family and physician. The latter can treat a case with greater certainty and success if he but knows the hourly condition of the patient in his absence.

HOW TO PREPARE THE BED.

With a good mattress to start with, we have the most comfortable foundation that can be found. Cover with a light soft pad, so that the buttons on the mattress will not irritate the patient. Pin the pad securely at the four corners with stout safety pins, this being necessary to prevent wrinkling. Next cover the pad with a strip of rubber sheeting or oilcloth a yard wide, which should be drawn smooth and pinned to the edge of the mattress. In case there is no rubber sheeting or oilcloth at hand, several layers of paper under the pad will answer the purpose. Now cover the bed with a soft, white sheet, drawing it smooth and pinning securely to the underside of the mattress.

HOW TO PIN THE SHEET.

The sheet should be drawn tight, the ends folded under, the sides drawn down and the corners mitered, much the same as a paper cover would be placed over a book. These corners should be accurately pinned to the underside of the mattress with large, stiff safety pins, which will hold it in place until it is necessary to remove it. One pin for each corner will be sufficient.

It will not be necessary to pin the sides of this sheet down, as it will be held by the "draw-sheet," when the latter is pinned in its place.

In pinning the sheets to the bed always turn the point of the pin away from the center; this lessens the strain at the point, and gives a more secure fastening. In bed-making, pin the sheet temporarily first at the foot, then draw it smooth, folding carefully, miter the corners, and pin it securely at the head. When this is done, it will be an easy matter to arrange the corners at the foot of the bed after drawing the sheet smooth and tight. Do not use more pins than are necessary, as the sheet can be removed with less trouble when a small number is used.

If the directions are carefully followed, a firm foundation will be completed, which will not wrinkle under the patient, will be comfortable, and lessen the danger of contracting bedsores.

Fold a sheet smoothly to about a yard in width—an old soft sheet is better for the purpose—and pin across the middle of the bed. This is known as the "draw-sheet"; it can easily be removed without disturbing the patient. Safety pins only should be used about the bed, as common, short pins will work loose or may injure the patient.

Place the top sheet over the bed, tucking it well under the foot of the mattress. A warm, light-weight blanket, folded to fit the bed properly, will be sufficient cover for the day. An extra blanket should be kept in readiness for night use or whenever it is required. Usually patients are allowed more covers than are necessary or comfortable. It is better to keep them just comfortably warm than to load them down with too many blankets.

Do not use a heavy coverlet or spread on the sick bed. A clean, white sheet is much to be preferred, as it is of lighter weight and can be changed every day if necessary. A small feather pillow, and a large one, always kept fresh and clean, will finish the bed-making. Too much care cannot be given to the details of this part of the work, as so much of the comfort and ease of the patient depends upon a properly constructed bed. A clean, smooth bed is a joy to a person in health, and much more so to an invalid. But aim to keep the bed clean and tidy without continually picking and pulling at it, and thus annoying the patient. Insist that the covers be kept straight, and there will be little trouble in keeping it in order.

Always have a good supply of clean linen—sheets, pillow slips, and towels—on hand, and do not use soiled ones. In fever cases change all the linens frequently to prevent reinfection.

HOW TO CHANGE THE SHEET WITH THE PATIENT IN BED.

To change the draw-sheet with the patient in bed, unfasten the safety pins, have the patient lie flat on his back and draw his knees up. Pass one hand under the small of the back, and gently raise him enough to draw the sheet out. Always have a fresh one rolled ready to slip under while he is in the raised position. This clean sheet should be folded the proper width, and rolled tightly. Raise the end of the draw-sheet to be removed, and place the fresh one in proper position to be quickly rolled under the patient. The end should be pinned properly to the mattress on the side from which the nurse is working before the soiled linen is drawn out. This will make it much easier to straighten out, and prevent wrinkling. After the patient has been lowered to the bed again the opposite side can be drawn as smooth as possible and pinned to the underside or lower edge of the mattress.

The object in having the patient draw the knees well up is to allow him to assist in raising himself, while the hand under the back relieves

the strain. If the patient is unable to help raise himself, it is better to call some one in to withdraw the soiled sheet and roll the other under, while the nurse raises the patient with one hand under the small of the back and the other under the thighs.

To change the lower sheet, remove the pins from the corners, also from the draw-sheet. Roll the soiled linen toward the patient, tucking it well under him after turning him on his side, if his condition will admit. Have ready a clean, well-aired sheet and a draw-sheet. Roll the draw-sheet as before directed, and roll the other sheet lengthwise. Pin it at the two corners from which you are working, unroll it toward the patient, tucking it under the sheets to be removed. Pin the draw-sheet in place, and tuck this also under the patient as directed. Now the patient can be gently turned back, the soiled sheets removed, and the fresh ones drawn smooth and securely pinned. In removing these sheets, the pillows should first be removed from the bed, allowing the patient to lie flat and thus aid the nurse.

With a little practice the bed can be quickly changed with little annoyance to the patient and little strain on the nurse. It is the faculty of getting at it properly and having everything ready at hand that makes it easy. There need be no great bustle nor house cleaning aspect, if things are rightly managed. Be quiet and systematic in this, as in other sick room work.

BEDSORES, PREVENTION AND MANAGEMENT.

Patients who are long confined to the bed are subject to "bedsores." Such sores occur very rarely under the vigilance of a careful nurse, but neglect and uncleanliness will be most sure to cause them, and, once started, we have a serious annoyance to contend with.

To prevent bedsores, do not allow the patient to lie in one position hour after hour. In case of fracture of the hip, etc., the patient cannot be moved much, but, by using rings and air cushions, the point of severe contact can be relieved. Whenever possible, turn the patient a little every three or four hours to allow the blood to circulate freely through the part congested by the weight resting upon it. Bathe the back, hips, shoulder, or any part that becomes red from contact with the bed, thoroughly, at least once a day, with warm water and castile soap, and rub well with alcohol and zinc stearate; a solution of alum and alcoholic tannic acid powdered over the parts will also toughen the skin and prevent abrasion.

Watch the heels, ankles, knee joints, and elbows. They are sometimes neglected and become sore, especially in patients who are greatly emaciated. Keep the bed linens dry and smooth. Use old, soft sheets for draw-sheets, and if the elbows or heels begin to show signs of irritation, pad them with absorbent cotton, the pads held in place with strips of adhesive plaster or bandages.

Massage the back, hips, and shoulders frequently to prevent the blood settling in any place.

The greatest dangers in bedsores are caused by wet beds. The skin may become parboiled and abrased, the cells become inflamed, suppuration take place and gangrene follow. In these cases, every energy must be bent to keep the bed and patient clean and dry. Use astringents such as alum and tannin in bathing, and a rubber ring to keep the hips elevated. Never use a feather bed under a patient. The increased heat on the back will be greatly conducive to the early formation of sores.

Should bedsores develop after every care and precaution have been taken, it remains only to endeavor to heal them as soon as possible. Again, thorough cleanliness is necessary. Cleanse the sores with warm water and castile soap; disinfect with a solution of creolin, one teaspoonful to the pint of warm water; dress with lanolin, oxide of zinc, balsam of Peru, or zinc stearate and boracic acid, as the physician may advise. Use only sterilized cotton and bandages or strips of adhesive plaster for dressing. Linen lint is not so much used since the absorbent cotton has been placed on the market. The cotton is much less expensive. Poultices may be used to remove gangrenous tissue, but not longer. Dress at least once a day. Remove all pressure from the part by use of rings, and promote circulation in every possible way. If bedsores are neglected they become serious through the drain from discharge, and by blood poisoning from absorption.

HOW TO TURN A PATIENT IN BED.

Some patients will constantly slide down in bed when unable to help themselves back. It then becomes necessary to draw them back upon the pillow. To do this easily, have the patient clasp his hands behind your neck, place your arms around his shoulders under his arms, raise him gently, and draw him up to the desired position.

To lift a patient out of bed, raise him in a sitting position, swing the feet over the side of the bed, reach around his back with one arm, place

the hands under his arms, and lift him gently. Have the chair or couch close by the bedside before he is disturbed. If the patient, for any reason, must be lifted bodily from the bed, two can do it very easily. One should place an arm under his knees, the other arm under the hips, while the nurse should place an arm under his head and the other under his shoulders. Do not allow the patient to strain or try to assist, as it will make it much more difficult to lift him. Explain to him that he is to lie in a supine condition.

To turn a patient in bed, place one hand under the hip and one under the shoulder. Have him turn his head toward the side to which he wishes to be moved, and gently roll the body. Do not stand on the side toward which he is to be turned and draw him toward you. It can be done with more comfort and less annoyance to the patient to turn him from you.

A practical way to move rheumatic patients is to have three assistants, one at each corner of the bed. Grasp the corner of the lower sheet firmly and pull away from the center, all gently raising it at the same time. This is not only hard on the poor sufferer, but also on the ones who do the lifting; but it is the easiest way to do it. Have mercy on one who is suffering from rheumatism or rheumatic fever and work as gently as possible. Fresh linens should be in readiness to be immediately slipped under the patient and pinned in place, and the soiled ones can be removed after the patient has been lowered to the bed and rested awhile. Removing the soiled bedding in these cases is a delicate task and must be done with gentleness.

If a patient is to be raised in bed for the physician to examine the lungs from the back, have the patient cross his arms and extend the hands. The nurse will then stand at the foot of the bed, grasp the hands and draw the patient into a sitting posture leaving the back free for examination. By crossing the arms much of the strain and sagging of the body is prevented.

PACKS—HOT AND COLD.

Hot Packs.—In using any wet packs, the bed must first be protected by rubber sheets, oil silk, or oilcloth. In rheumatism, sciatica, neuralgia, and localized pains the hot pack is frequently given.

After protecting the bed, prepare several large squares of flannel; old blankets or undervests will answer the purpose. It is better to fold

them into squares of several thicknesses and baste them together, as they will be easier to manage, and hold the heat longer.

Hot packs are sometimes given with saline solution, alcohol (diluted), or hot water. Occasionally some volatile oil is used. In rheumatism oil of wintergreen or oil of menthol is used.

To use the pack be careful that the surface is sufficiently cool to avoid burning the patient. Place several thicknesses of the pack around the affected part and cover with a rubber or oilcloth blanket to keep the heat and steam in. Change frequently, never allowing the pack to get too cool. When the heat seems to make the patient nervous or faint, apply cold cloths to the head and back of the neck and it will relieve him. Excessive sweating will reduce the strength rapidly and hasten emaciation.

Cold Packs.—Cold packs are much used at the present time in fever cases and pneumonia. They are also used directly over localized pains, sprains, and on the neck and skull to prevent delirium. Unless rubber water bottles are used it will be necessary to protect the bed, as in giving a hot pack.

In case it is desired to place a pneumonia patient in a cold pack, or ice jacket, first cover the chest both front and back with a thin layer of absorbent cotton. Pack finely chopped ice around him and cover with another layer of cotton, which will help to absorb the water from the melting ice.

In case it is desired that ice should not be used directly, a cold pack can be used like the hot pack, substituting ice water for the hot. This answers very well if constantly changed, and in all cases, save pneumonia, may prove more desirable. However, one must be governed by the physician. Whenever practicable, we advise the use of water bottles, since they protect the bed from water, and thus lessen annoyance and reduce liability to bedsores.

BRAND'S BATH FOR TYPHOID (MODIFIED).

The American rule for giving Brand's bath for typhoid differs very little from the German save in the temperature of the water. In cases where the heart is a little weak or the patient hypersensitive, half an ounce of brandy or whisky should be given a few minutes before the patient is put into the tub.

Place a portable bath tub beside the bed, fill it about half full of water,

and put into it sufficient ice to lower the temperature of the water to whatever point the physicians may prescribe for the bath. Have a pail of chopped ice at hand to put into the tub after the patient has been submerged, in quantity sufficient to bring the temperature down five degrees lower. A bath thermometer is an absolute necessity in giving tub baths.

Prepare the patient by removing the clothing and giving him a brisk friction rub from head to foot until the skin is very red. Be careful not to use any weight over the bowels. A towel should be pinned about the loins, an ice cap applied to the head and neck, and, with some one to assist, he should be gently but quickly lifted from the bed and as quickly submerged to the neck in the bath. The shock is greater to some people than to others, and the pulse must be closely watched, and if it becomes hard or depressed the patient should be removed from the tub at once, and another half ounce of whisky given.

While the patient is in the tub, keep up the friction constantly, from head to feet. This brings the blood to the surface and gives it a chance to be cooled. Keep the patient in the bath from 12 to 20 minutes if he stands it well, then gently lift him back into bed and roll him in a warm blanket. He will likely shiver for a few minutes, his lips will be purple, but he will soon get warm and probably go to sleep. The temperature should be taken an hour after the bath and be recorded. The rule for administering the ice tub bath is generally, "When the temperature reaches 103.6 degrees F., it is an indication that the Brand bath is required." These are never given more frequently than every three hours, and should not be attempted by non-professionals, except in the presence of a physician, as there is more or less danger of collapse from the shock.

BANDAGES.

Every home should have on hand a stock of bandages and cloths for emergencies. Bandages, lint, and absorbent cotton can be obtained from almost every drug store now, and are not very expensive, but old sheets torn into strips from one to four inches wide and the ravelings pulled from the edge make good bandages. Cheese cloth or gauze make the best, however.

When the bandages have been cut or torn into proper widths, they should be wound tightly and evenly over a lead pencil, wrapped in a clean piece of paper and tied separately and placed in a hot oven until

thoroughly heated through. The paper should not be removed until the bandages are required for use.

The head is perhaps the most difficult part to bandage. This is done in what we term a "re-cur." First wind the bandage around the head over the forehead and above the ears about two or three times. Hold the bandage in front with the thumb, let it extend up over the head and down to the bandage in the back, where it should be held in place with the middle finger. Next, put it up over the head again and hold this second end with the thumb; back again in re-cur and put it around the forehead once or twice, until these ends are held in place. Repeat the process until the scalp is covered.

In bandaging always unroll the bandages from you. Do not wind the bandage around, but cross and recross, keeping it firm and tight. In case of bandaging a taper, as in the forearm or leg, it is necessary to frequently tighten the bandage by making a half turn of the roll, thus crossing the bandage upon itself at an angle. This tends to draw the opposite edge down. Large dressings like laparotomy, or spica bandaging, require the service of an experienced person. The physician can give the young nurse a practical demonstration, which will greatly aid her in bandaging. In bandaging a hand or finger, let it go around the wrist several times. This will help hold it in place.

A "T" bandage is made with two strips of cloth, one long enough to go around the waist and the other sewed to the middle of the waist bandage and long enough to go over the dressings between the thighs and pin to the waist bandage.

A "four-tail" is any bandage with the ends stripped into tails for tying. They are named according to the number of strips into which the ends are torn, and may be four, six, or eight tail bandages. They are used to tie other bandages on, instead of sewing them or using pins, and are very convenient.

(See "Emergencies," page 572. See illustrations.)

Rubber Bandages.—Rubber bandages are very little used, save in preparing for operation by Esmarch's plan, or to prevent swelling, as in varicose veins in the legs, and for support, as of a hernia. When used, care should be taken that they are not doubled at right angles with themserves, or the elastic freedom will be lost. Silk or elastic stockings and supports have replaced the rubber bandages, and are in every way to be preferred.

STUPES.

Stupes are hot applications used for their counter-irritating effects, to allay pain, and remove gases. Turpentine, chloroform, laudanum, oil of wintergreen (*ol. Gaultheria*), tincture of capsicum, menthol, and many other agents are used.

Prepare flannels as for a hot pack, wring them as dry as possible from very hot water, and sprinkle over one side a few drops of whichever agent the physician may prescribe. Be careful that the patient is not blistered. Never apply chloroform directly to the skin. Hold the hot flannel an inch or two away from the part to be treated.

Turpentine is much used in tympanites of typhoid or other intestinal disturbances where large quantities collect and cause distention of the abdomen. It is also used internally by enema.

Laudanum is used where excessive pain demands something to quiet the nerves and deaden the sensation, as in abscesses, boils, carbuncles, and fractures. Wring the cloth out as hot as possible, sprinkle it well with laudanum and apply directly over the localized pain. As soon as the pain begins to be less, remove the cloth, replacing it with a dry, warm flannel.

ENEMATA.

Enemata or injections are used to relieve the colon of fecal matter in constipation, or to cause a quick, ready movement of the bowels. Enemata are usually divided into two classes for convenience: viz., simple and nutritive.

In giving injections to very small children, the hard rubber syringe and a No. 14 male catheter, or a small rectal tube are necessary. For adults, a bag, or Davidson syringe, and a long rubber rectal tube are indispensable.

To administer a simple enema, place the patient on his left side, with hips slightly raised. Protect the bed with rubber sheet or bath towel. Prepare the solution according to direction below. Have the temperature of the solution about 108 degrees, as the syringe will cool it to some extent. If a Davidson syringe is to be used, place the rectal tube over the end and press the bulb until the solution passes through freely without being accompanied by air. Keep the suction end in the solution, never allowing it to come to the surface, or air will get into the syringe. Oil the rectal tube with olive oil or vaseline, and insert gently into the

rectum. As soon as it passes the sphincter muscle it will pass readily into the descending colon, unless it be obstructed by hard fecal matter. Care should be taken that the tube does not double on itself. This can be obviated to a certain degree by beginning to press the bulb gently as soon as the end of the tube passes through the sphincter muscle. When the tube has been inserted its full length, raise the bowl about a foot and allow the solution to slowly siphon out. By giving it slowly much better results will be obtained.

The chief objection to the use of the bag or douche syringe is that the general inclination is to allow the solution to run too fast, causing pain for the patient and poor results from the enema.

The amount of solution given depends largely upon the patient's ability to retain it for a few minutes. Small children may take half a pint, while an adult will take from three pints to two quarts. Do not let the patient think about what is going on. Lead his mind from it by conversation, and it will be found that a larger quantity can easily be given. Insist that he keep his mouth open, as there will be less strain.

In preparing solution for rectal injection, always use water that has been boiled. Do not use salt, if soap is to be used, or a gummy substance will form, filling the syringe.

When a simple enema is called for it usually means three pints of warm water, to which has been added white castile soap until it is smooth and a suds easily formed. Sometimes a cup of sweet milk is added.

For obstinate cases use one quart water, 110 degrees, two ounces olive oil, and one ounce of glycerine. Be sure that the syringe is thoroughly cleaned after using olive oil, as it will quickly rot the rubber, and the syringe will leak.

In cases of impacted fæces with little peristaltic action, one quart to two ounces of Epsom salts, dissolved in a quart of warm water, slowly given and retained for a few minutes, will usually prove effective. In some cases it is necessary to resort to ox gall one ounce to water one pint for quick results.

In cases of chronic constipation, glycerine suppositories are invaluable. They can be used with little inconvenience, and often prevent hemorrhoids, or the reappearance of same.

Nutritive enemata are only given upon advice and direction of the physician in cases physically incapable of taking food into the stomach, or of digesting the same. There are predigested foods on the market

which are now much used, and are to be preferred. However, if they are not at hand, the white of eggs (some physicians use the yolks), milk or cream, beef tea, and strong, black coffee, with a little brandy, can be used. A nutrient enema should never be larger than can be easily retained. Small children will retain from one to two ounces, while an adult will retain from four to six ounces, and it should not be given more frequently than once in five hours.

In case of exhaustion, nausea, and continued vomiting, shock from surgical operation, and depression after an anesthetic a few ounces of strong, black coffee will prove very useful when given per rectum. Pepsin is often added to the nutrient enema to digest the food.

HYPODERMIC INJECTIONS.

The use of the hypodermic needle has become quite common, and quick results from stimulants are obtained by injecting them under the skin. Triturates and tablets are now provided so that physicians feel quite safe in prescribing. To the inexperienced the needle looks horrible. There need be no horror or pain from its use. Prepare the solution as directed, clean the needle with alcohol or carbolic acid, rub the spot on the arm, or whatever part the needle is to pierce, with alcohol and a bit of gauze or cotton to bring the blood to the surface, pinch the flesh up between the thumb and index finger and insert the needle with a quick motion. The patient will scarcely feel it. Press the piston slowly, allowing the solution to diffuse, withdraw the needle quickly, and again rub the place with alcohol. If these directions are carefully followed, there need be no pain or infection. The hypodermic should never be used, save by the direction of the physician.

COUNTER-IRRITATION.

Counter-irritants are usually applied over the seat of the disorder, but are not infrequently placed on some remote part to obtain the so-called revulsive action. As, for instance, mustard footbath and draughts on the feet relieve the head. Mustard is more frequently used than any other rubefacient, although liniments, camphorated oils, ammonia, turpentine, etc., are often used.

To make a mustard plaster, or sinapism, use one part powdered mustard to from two to five parts of flour, according to strength desired.

Mix the paste with tepid water, and spread on a thin cloth. Cover with a piece of muslin and apply to part desired. It will likely feel cool at first, but will soon get warm. Do not use hot water or vinegar, as the full action of the mustard is desired. They destroy much of the volatile action. Do not leave the plaster on the patient long enough to blister, for a sore thus produced is painful and slow to heal. When the mustard has caused a good irritation, remove the plaster. If it burns too much, sponge the skin with vinegar to counteract the mustard.

In preparing mustard paste for children, mix with glycerine, and the action will be less severe.

To make a cayenne pepper plaster, mix the same as mustard, using a tablespoonful of cayenne in a thin paste with flour. Or the pepper may be stitched into a flannel bag, and this wrung out in warm water and applied. Mustard paper and capsicum vaseline are good substitutes and easy to use.

BLISTERS.

The agent most generally employed in blistering is cantharides, and should never be applied where the skin is broken or tender. A piece of oiled tissue paper between the plaster and the skin will not only protect the skin but accelerate the action of the blister.

In preparing to blister, wash the part thoroughly with castile soap and water, and dry it well. Shave the part if there be any growth of hair upon it. Secure the cantharides in place by a bandage instead of strips of adhesive plaster, thus lessening the danger of tearing the skin in removing it.

Blistering should take place in from 6 to 8 hours. If not within 12 hours remove the blister and apply a poultice, when the desired effect will usually be produced. In removing the plaster, be careful not to tear the skin. Remove all particles of the cantharides with a bit of oil. When the blister is full of serum, a small incision may be made at the lowest point to allow it to drain out, or it may be left to be reabsorbed.

Blisters are rarely used now, and only upon direction of a physician. If it is desired to raise a blister quickly, it can be done by moistening a bit of gauze or cotton with chloroform or ammonia and applying to the part to be blistered. These blisters are more in the nature of a burn, and if the applications are left long on the part they will burn deeply into the tissue.

CUPPING.

The process known as cupping is frequently used to relieve pain and congestion. It requires skill, and especially wet cupping is never given except in the presence of a physician. Cupping glasses are required for this operation, though small tumblers or wineglasses with smooth edges can be used in the absence of any regular apparatus.

Have at hand a lighted taper or candle, a little alcohol in a glass, and a small swab or camel's-hair brush. See that the glasses are clean and dry. Prepare the patient by exposing the part to be cupped, dip the swab or brush into the alcohol and squeeze the greater part of the spirits out of it. Rub the inside of the glass with the brush, keeping it well away from the edge, and not allowing any of the alcohol to trickle down the side of the glass upon turning it down. Pass the glass over the flame of the taper, when a blue flame will immediately appear, but will last only three or four seconds; hence the necessity of working lively.

Place the cup over the part to be cupped, when it will be seen that the oxygen having been burned out of the glass there will be sufficient suction to draw the flesh well up. Prepare another glass in like manner, always being careful not to use alcohol enough to heat the edge of the glass or drop on the patient, for there is no excuse for burning him. Do not let the glasses remain long enough to cause discoloration. Grasp the glass by the top and with the fingers of the other hand press the flesh away from the edge. As soon as a bit of air enters, the glasses will be released. Do not place a second glass within the ring formed by another. Glasses furnished with rubber bulbs for exhausting the air can be had instead of using alcohol.

In wet cupping the same apparatus is used, in addition to which there must be a scarificator, absorbent cotton, and adhesive straps. After cupping, the scarificator will be applied, making a series of little cuts, and the cups replaced until sufficient blood has been extracted. A dry dressing will usually suffice, though sometimes it is better to dress in some ointment like lanolin or carbo-vaseline. Wet cupping is seldom used, except to relieve inflammation of the kidneys.

LEECHES.

Leeches are not so much used now as they were formerly. Those used are of two kinds, the American and the foreign. The latter are to

be preferred in most cases, since they are more voracious, and will draw four or five times their own weight of blood. Leeches will draw more blood from a child than from an adult, owing to the thinness and greater vascularity of the skin. For this reason domestic leeches are chosen for children.

Leeches should never be applied over large blood vessels, but over a bony surface upon which pressure can be made in case it is necessary to check a hemorrhage.

Sometimes it is difficult to make leeches bite. Fumes of sulphur, vinegar, strong odors, or tobacco will affect them. The leech also objects to certain drugs, which may have been taken internally. A slight scratch, just enough to give them a taste of blood, is usually sufficient inducement.

The part to which the leech is to be applied should be thoroughly washed and dried before the leeches are applied. The leeches should also be washed and dried in the folds of a towel, and never handled. If they are to be used in the mouth or nose it is well to put a silk thread through the tail to prevent them from being swallowed. In case one should be swallowed, it will become harmless by drinking a quantity of salt and water.

When they are full they will drop off. Never attempt to pull them off by force, or the teeth will be left in the wound and abscesses may form, or erysipelas result from it. The bite leaves a permanent star-shaped scar. If it is desired to remove them before they are full, sprinkle a little salt over their heads, when they will release themselves and drop off. If the hemorrhage continues, it can be checked by hot or cold applications, or by touching with nitrate of silver.

CATAPLASMS (POULTICES).

Cataplasms or poultices are a convenient form of applying warmth and moisture. Their effect is to soften the tissues and dilate the capillaries, relaxing tension of inflamed parts, and relieving pain. Early application oftentimes checks the progress of inflammation.

When suppuration begins, they facilitate the passage of pus to the surface and limit the spread of induration. Poultices should be applied as hot as can be borne, and covered with an oilcloth or rubber to keep the heat and moisture in. Poulticing should not be continued too long, as it renders the flesh sodden and irritable, and may cause sloughing.

Gauze, muslin, spongiopilin, which is made of sponge and wool felted together and one surface coated with a preparation of rubber, are used in preparing poultices, which may be made of a variety of ingredients. Linseed meal is very generally used, and when of good quality makes excellent material. It should be well cooked. It is very glutinous, and should be of the consistency of dough. Spread about half an inch thick upon a piece of muslin of the required size, leaving a margin of an inch on all sides. It is better to cover it with a coarse, net like mosquito netting or tulle, though it may be applied directly to the skin. If it dries and adheres to the skin, a little oil will remove it. Keep the poultice warm by the use of hot water bottle or hot flannels.

Poultice jackets are sometimes ordered for the chest. They should be made of two pieces, one for the front and one for the back. These can be tied over the shoulders with tapes to prevent them from slipping down.

Bread poultices are more bland than linseed, but cool quickly and hold less moisture. They dry and fill the bed with crumbs. Milk should not be used in these poultices, as it soon sours. Weak carbolic solution may be used when a disinfectant is desired.

Yeast poultice is often used to hasten sloughing in gangrene. Mix six ounces of yeast with an equal amount of warm water, and stir into it fourteen ounces of flour. Let it stand near the fire until it rises. Apply while fermenting.

Starch makes a mild poultice and retains heat well. It is much used in irritating skin diseases. Mix as for laundry use.

Slippery elm, Indian and oat meal, rye, and other flours are used, and are cooked the same as linseed meal.

Scraped carrots, boiled or raw, are thought to have a peculiar cleansing effect. Hops, when sewed into a bag and wrung out in hot water, have a soothing effect. Laudanum is used for its sedative effect. Powdered hemlock leaves, one part to three of linseed meal, have something of the same nature. Constitutional effects from the drugs must be watched out for when they are used. There are many other kinds, such as horseradish or onion poultices, which are used for their stimulating properties, but for ordinary purposes the linseed meal is preferred.

Poultices should be renewed whenever they get cold or hard. If there is a large discharge of pus or purulent matter, they should also be frequently changed.

SWABS AND MOUTH WASHING.

To keep a patient's mouth clean in fever cases is very important. After taking milk or gruel the patient should cleanse the mouth with fresh water, or a mild salt solution. The teeth should be cleaned, and the sordes removed once or twice a day. This can be done with a piece of gauze over the index finger, or by using a swab made by winding the end of a stick or lead pencil with absorbent cotton or gauze and carefully sponging the mouth.

Tincture of myrrh is excellent for cleaning the teeth, and good for the gums, acting as an astringent. A wash made of lemon juice, glycerine, and ice water, equal parts of each, is excellent and agreeable. Washing the mouth with boracic acid solution also helps to keep it fresh, and is very soothing and healing. If the tongue and lips are dry and inclined to crack, use cocoa butter to soften them. Do not use vaseline or glycerine for this purpose.

ICE BAG.

The ice bag is a rubber cap or helmet that is used for applying ice to the head, and is more convenient than the rubber water bottle for this purpose, since the mouth or opening is larger.

To use the ice cap, fill it full of finely chopped ice, mixed with a small quantity of table salt. It is always well to place a sponge or some absorbent cotton in the mouth of the bag before closing it, as it will absorb some of the water and prevent it from leaking.

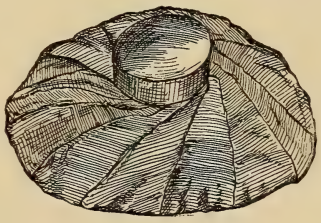


FIG. 59. ICE BAG.

Place a moist cloth or moist cotton over the head and apply the ice cap, tying it in place with bandages if necessary. The moist cloth will aid in keeping the head cool and prevent contact of rubber with the flesh. Sometimes, when the cap is not nicely adjusted, there is danger from frost bite.

In fever cases, delirium, or injury to the skull the ice cap or helmet is indispensable. An improvised bag can be made of oil silk, rubber, or other material, but it will generally leak and prove unsatisfactory.

EMBROCATIONS—LINIMENTS.

When any remedy in liquid form is applied to a part by rubbing it in, it is called a liniment, and may be either soothing or stimulating, or a

counter-irritant. Liniments usually contain poisonous ingredients, and care should be taken that they are not left where they will be taken internally by mistake. The hands should be well washed after using.

For rubbing in liniments see article on "Massage" (local), page 272.

ENDERMIC MEDICATION.

Endermic medication, or feeding through the agency of the skin, is now used only in rare cases. Some constitutional diseases are still treated with mercurial inunction, and consumptives are given hot baths with massage and cod-liver oil applied to the skin. In either instance the physician should prescribe the treatment.

FOMENTATION.

See "Hot Pack," page 230.

CLYSTERS.

See "Enemata," page 234.

SINAPISM.

See "Counter-irritation," page 236.

ATOMIZERS AND SPRAYS.

See "Nasal Douche."

FIG. 60. NASAL DOUCHE.

NASAL DOUCHE OR SPRAY.

The nasal douche is now rarely prescribed because of the danger which attends it. It is more or less likely to affect the eustachian tube and cause deafness. Pain in the ear should be a sign of discontinuance of any nasal treatment.

The nasal douche has been superseded by the post-nasal spray, which is far less dangerous and more effective.

Atomizers for spraying the nose and throat, with full directions as to their use and management, can be found in any drug store, and are inexpensive.

Gargles for the throat are not so effective as the spray of the atomizer, and, by spraying, the teeth are protected from injury so likely to occur from the use of iron and acids in gargles. The mouth should always be well rinsed with an alkaline solution like soda or limewater whenever acids are used near the teeth.

NECESSARY UTENSILS.

There are a few utensils indispensable to the sick room. These are inexpensive and any family cannot afford to be without them.

One or more 2-quart rubber water bottles for either hot or cold applications as desired seem almost necessary. Cloth covered ones can now be had and are much to be preferred, since it lessens the danger of burning or blistering when hot water is used. In case the bag is not cloth covered, a cover should be made to slip over it before using near the patient. Do not risk wrapping in a towel. They will sometimes slip out and accidents occur.

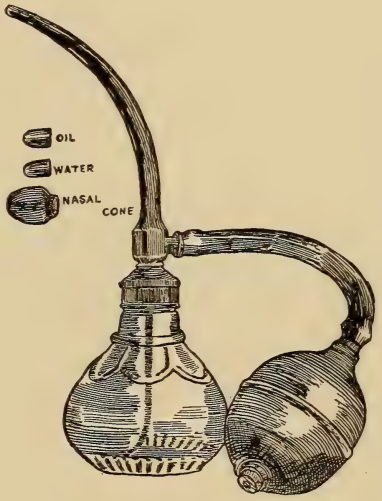


FIG. 61. ATOMIZER OR SPRAY.

In using hot water, never fill more than half full, then lay the bottle flat until the water comes up to the nozzle before putting in the stopper. This excludes the air and steam, lessens the danger of explosion, and also keeps the water hot for a greater length of time.

In absence of rubber bottles, or when a greater number is needed than is at hand, quart glass bottles that can be tightly corked, wrapped in towels and securely pinned with safety pins, will prove useful. Care should be exercised in filling, not to use water hot enough to break bottles and scald the patient. To burn a patient is unpardonable, and a nurse who is careless enough to do so should not be trusted in a sick room.

FIG. 62.
MEDICINE GLASS.

In selecting a bedpan, the modern, square, porcelain pan is preferred, as it is lighter, can be quickly warmed, and is more comfortable and more durable.

In absence of a urinal, wide-mouthed or large-necked pickle bottles prove very satisfactory and convenient.

A bag syringe or douche is indispensable. A bulb or Davidson syringe and a glass or hard rubber syringe should also be found among the utensils.

A graduated medicine glass for liquids, a glass tube for taking iron, administering liquids to patients unable to be raised, and a china feeding cup can all be had for a few cents and prove most valuable in sickness.

A bath bowl, some pure, not strongly-scented toilet soap, talcum powder, etc., should always be provided. A medium-sized, fine sponge, and several yards of bleached gauze or old linen, should be found among the bath perquisites.

A covered slop jar, either porcelain or china, one that will stand chloride of lime or other disinfectants, will complete the utensils which seem absolutely necessary.

A sputum cup is a necessary article in every sick room. China or porcelain ones with covers can be found at any china store. A bit of chloride of lime or some other disinfectant should be placed in the cup each time after it is cleaned. Old cloths, gauze, etc., should be always kept on hand to be used for sputum. It is better to burn such cloths than to wash them.

FIG. 63. NOSE SYRINGE.

For disinfecting see pages 158 to 162.

THE CHART.

A carefully and accurately kept chart is a most valuable aid to the physician. It has been remarked before that the physician can spend but a few minutes each day with the patient, and that, usually, at about the same hour each morning or afternoon. Consequently, he has no means of knowing just what takes place in his absence save through a careful report by sone one who has watched the patient, taken his temperature, and counted his pulse at regular intervals. A nurse cannot trust details to memory, hence another necessity for having a daily record.

Chart sheets can be found at almost any apothecaries', or can be drawn up by the nurse when not at hand. A most convenient form, one that is simple and easy to keep, is given on pages 246 and 247.

Write the name of the patient and number the sheet. Write name of attending physician and his diagnosis of the disease. In their proper spaces fill in the month, day of month, day of week, and hour when the temperature, pulse, and respiration (T. P. R.) are taken, and record them in the spaces marked T. P. R. Use the decimal system in recording fractions of a degree of temperature, as it will not then conflict with the small lines, which divide the degrees on the chart into fifths or two-tenths.

The dotted line running across the page at 98.6° is the normal temperature line. Any temperature above or below this point shows an irregularity in the system, and the farther the temperature stands from this point the greater the danger, usually.

After recording the figures as per direction, place a dot on the proper line showing the maximum height of temperature at the time the record was made. Connect this dot with the one denoting the previous record by a heavy line. It is better to use red ink for night records when it is possible, for it then gives the physician a correct knowledge of the state of affairs at a glance, and greatly assists him in deciding what steps are necessary to be taken.

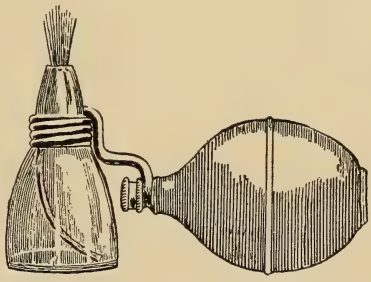


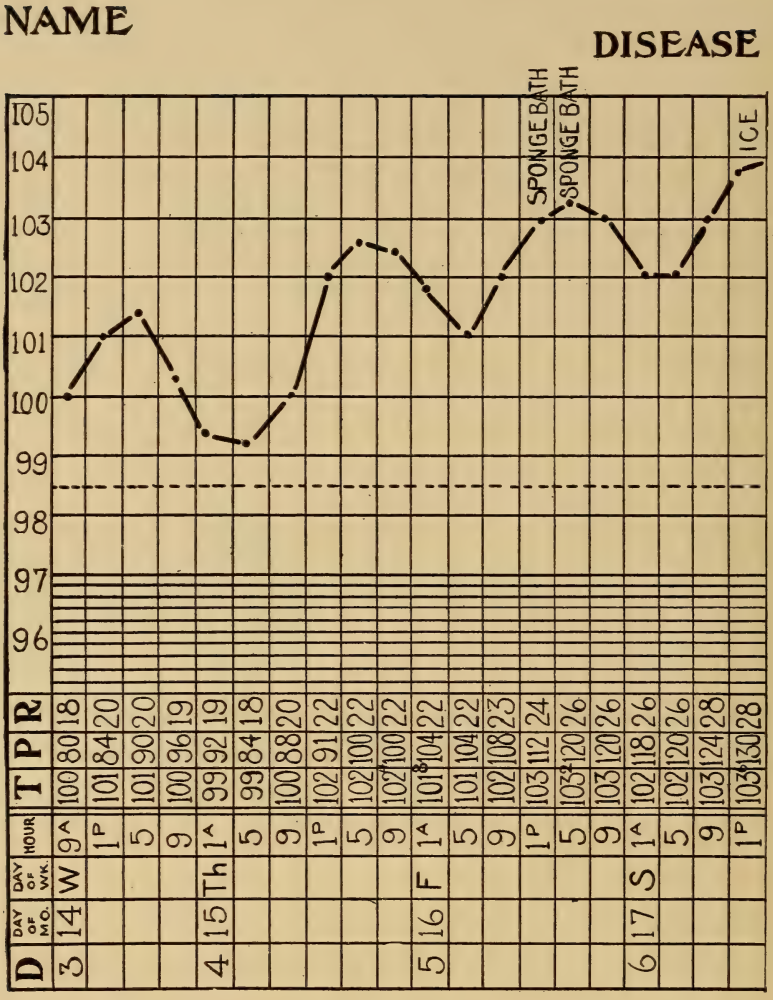
FIG. 64. OIL ATOMIZER.

When baths are given to reduce the temperature, connect the dots which show the point the temperature has reached before and after the bath, by dots instead of the heavy lines. This will show the effect of the bath.

On the reverse side of the sheet a record should be kept of the medicines administered, baths given, enemata, and cathartics and their results and any irregular symptoms that are noted by the nurse. In fact, anything that the physician should know that is not kept on the other side.

The importance of a well-kept chart cannot be overestimated. Inaccurate reports are not only useless, but are often dangerous. Every physician recognizes and appreciates a true record—and every patient benefits thereby.

(See Diagram.)

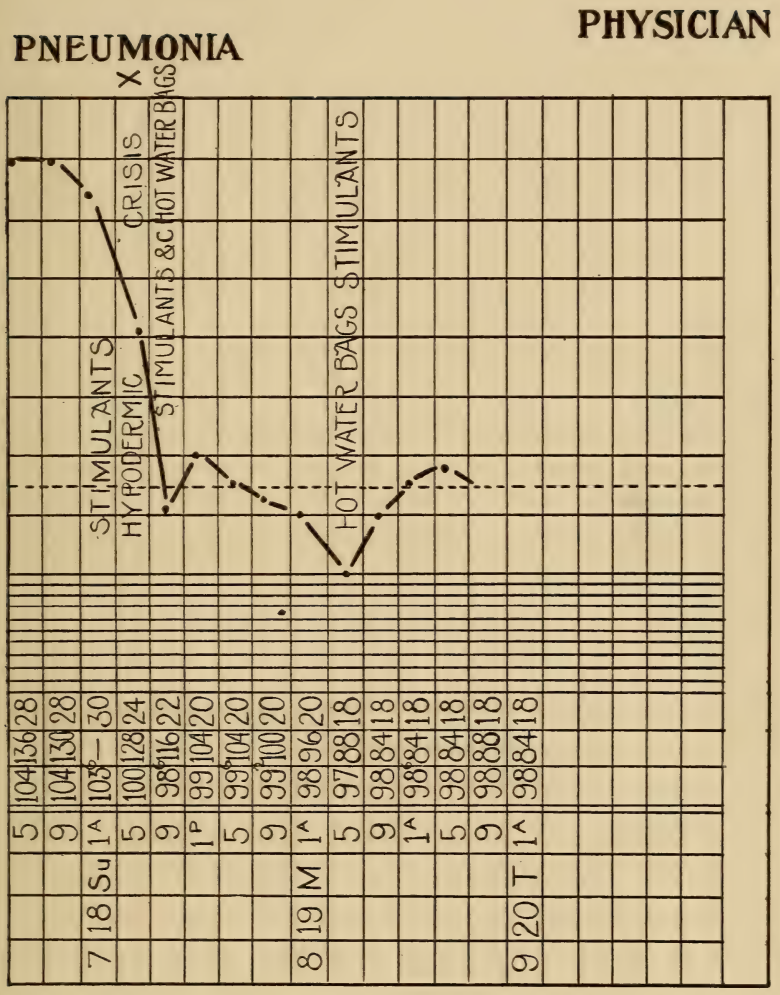


SPECIMEN CHART

SHOWING CRISIS OF PNEUMONIA.

Figures in left-hand column mark the Temperature in Degrees.

T—Temperature.
P—Pulse.
R—Number of Respirations per Minute.



SPECIMEN CHART

SHOWING CRISIS OF PNEUMONIA.

Dotted line across page is Normal Temperature of 98.4° F.

Observations are recorded every four hours during day and night.

CLINICAL THERMOMETER.

Every family should possess a clinical thermometer and everybody should know how to read one. Many times a person feels indisposed when really nothing is the matter with him. By trying the temperature one can quickly tell if there is likely to be any serious trouble by the reading of the thermometer. If there is considerable rise in the temperature above the normal point, it is better to consult a physician.

To use the thermometer, shake the mercury down below the normal point, being very careful not to shake the thermometer out of the hand. Place it under the tongue of the patient, except in cases of small children, and have him close his lips tightly over it. Let him hold it there for a full minute. Removing it, hold it so that the light will fall on it. If it be a triangular affair turn one side of the triangle up, and move from side to side gently till the mercury can be seen. Note to what degree and fraction it has risen, remembering the thermometer is graduated by fifths,—each step equals two-fifths of a degree. The twist in the tube above the bulb prevents the mercury from again falling till it has been shaken down. In children and delirious patients the thermometer may be placed in the armpit and held for four or five minutes.

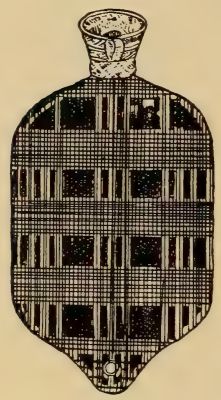


FIG. 65.
CLOTH COVERED HOT WATER BAG.

To clean the thermometer use a soft napkin or cloth moistened with water, or, in infectious or contagious diseases, some disinfecting liquid should be used. Do not use hot water, or the bulb will break. Do not use alcohol, or the figures will be removed. Clean thoroughly each time immediately after using, and shake the mercury down ready for use again. Always take and record temperatures at regular intervals, say every three or four hours, and always at the same time each day.

THE PULSE.

The pulse indicates the action and condition of the heart, and is a lifetime study. That the pulsations are about 70 per minute and regular in force and intervals is about all we can say to you in regard to the normal pulse. Any change from this is an indication that there is trouble.

To feel the pulse, place the tip of the middle finger on the palmar side of the wrist, about three-fourths of an inch from the inner edge. Do not use the thumb or index finger in taking the pulse, as there is a slight pulsation in those fingers that makes the true pulse feel uncertain.

Count each pulsation for a full minute and record. Each time note if the pulse feels the same. In fever cases, and other cases where there is toxic poisoning, the lift of the pulse will be quick and decided, with, perhaps, no increase in frequency. Such a pulse calls for expert attendance, as does one which beats so lightly it can scarcely be felt.

An intermittent pulse is one that pulsates regularly for a few times, then skips a beat, repeating at intervals. This should be reported to the physician.

Inexperienced or untrained nurses should not administer heart stimulants except under the direction of the physician.

One can learn a great deal about the pulse by noting the quality or feeling of the pulse each time it is counted. Always let the arm rest comfortably when counting the pulse, and do not count for record immediately after the patient has been sitting up or is excited in any way.

THE RESPIRATION.

The number of respirations per minute should be counted when the patient is unaware of it. This can be done by watching the rise and fall of the chest. The normal respiration in an adult is from 14 to 18 per minute. In a child it is more, varying according to age.

The quality of the respiration is also a study. In pneumonia and other pulmonary diseases there will be a marked increase of respirations. In case of worms in children, or any bowel trouble in infants, there is a marked increase. Any trouble with the heart, pleurisy, etc., causes shortness, gasping, or catching of the breath.

In counting for record, always count for a full minute. Do not record the respirations of a sleeping patient, unless it is done every time when he is sleeping.

MEDICATION.

It is never advisable to keep medicines in the sick room. The sight is annoying to the patient, and gives the room a drug store odor. They should be kept well covered in a cool, clean place. Remember cool drinks are appreciated by the sick, and tepid liquids are always distasteful.

Hence, if the medicines are disagreeable to the taste, much of the annoyance will be removed by keeping them cold.

Several large-necked bottles, carefully labeled for holding tablets, are indispensable. Poisons and disinfectants should be marked as such, and kept where danger from mistakes will be impossible. All cups, spoons, and glasses used about the patient should be kept clean and polished. This means a great deal to the sick.

It is a bad practice to feed medicines from a spoon. Small, graduated glasses can be obtained from any glassware or drug store, and are indispensable in dispensing liquids. One swallow from a glass is much more easily taken than two or three from a spoon, especially if the medicine is bitter, or unpleasant in any way.

All medicines containing iron should be taken through a straw, or glass tube, to keep the liquid away from the teeth. Milk and other liquids may be easily taken this way by patients unable to sit up, or to be raised comfortably.

Dry powders given on the tongue often choke the patient. It is better to moisten with a little water or glycerine before administering. In giving powders, or tablets, have the patient extend the tongue forward, thus giving opportunity to drop them well back, and preventing them from getting under the tongue, or in the teeth.

Oils are obnoxious to most people. They should be given in capsules when possible. A little strong, black coffee, taken before and after the oil, will remove the taste. A teaspoonful of sherry, or the juice of an orange, are also pleasant agents for covering the taste of oils.

In administering bitter medicines, bear in mind it is the roof of the mouth and back of the tongue that sense bitter, and a straw or glass tube can be used to advantage by those who object to it.

Much care should be used in administering the anodynes, or any astringent medicines, since there is more or less danger of strangulation. A little knowledge of medicine will aid the nurse in devising simple, ingenious ways of covering the taste, greatly to the relief and comfort of the patient.

There are other ways of administering medicines than by the mouth. Sometimes it is necessary to administer by rectum, by the hypodermic needle, or through skin absorption. Usually, however, these modes will be given under the direct supervision of the physician.

A word on the giving of injections or enemata may prove useful. Usually the patient should be placed on his left side, with hips slightly

raised. A bulb, or Davidson syringe, is best, especially in the hands of the inexperienced. Prepare the solution, which may consist of from one to three pints of warm water into which white castile soap has been rubbed till a smooth suds has been formed, or it may be made of milk and water with oils, or in any other way the physician may prescribe.

Place a bath towel under the hips of the patient to prevent soiling the bed. Oil the tip of the syringe and insert gently, not allowing the patient to hold his breath, which tightens the muscles. The end of the syringe should not be taken from the solution to allow air to get into the bulb. Press the bulb gently, and, when the solution is started, raise the bowl about a foot and allow the contents to slowly syphon out. This usually brings good results.

URINE.

From time to time the physician will wish to see a specimen of the patient's urine, and possibly want to make a chemical examination of it. Clean two or three four-ounce bottles and have ready for saving samples when called for. Always save the morning discharge for the doctor.

Measure the quantity passed in twenty-four hours and record same on chart. Learn to observe whether the color is light or dark, straw color or amber, clear or cloudy, if there is a vegetable or ammoniacal odor. In fact, to keep posted as to every detail so that information of a valuable nature can be given if the physician should ask for it.

In cases with high temperature the quantity will be small and very dark, almost wine color. Certain drugs will increase the quantity. Niter, Rochelle salts, etc., act in this direction.

FAECES.

What is said of watching the character of the urine applies also to watching the stools. Observe the color, condition, whether formed or liquid, if the food is digested or in chunks, etc. Report diarrhœa or constipation, and keep record of number of movements of bowels each day.

For disinfecting urine and stools in contagious and infectious diseases see page 163.

BATHS.

How and When to Bathe.—Baths are now extensively used in treatment of disease as well as for cleanliness. It is to be assumed that

every person has a full bath at least once a week, otherwise the pores of the skin become clogged and cannot perform their proper function. Cleanliness is a prime requisite to the health of the body, and to the social status in all civilized countries.

Baths as a therapeutic agent are very valuable when judiciously employed. They should be given only by order of the physician, but when ordered cannot be given too faithfully.

The German rule for baths is modified in this country. According to Brand's idea, a cold bath should be given whenever the temperature reaches 103° F. The Germans, too, use a much colder bath than is commonly used in this country.

In preparing a patient for any cold bath, apply friction, either by using a coarse towel or the hands, to the entire surface of the body, to increase circulation. Place a cold compress on the head and back of the neck. If a tub bath is ordered it will be given only in the presence of a physician in the absence of a trained nurse, but bed baths, sprinkle, evaporation, and sponge baths can be successfully given by anyone with average common sense and a little practice.

In fever cases, especially typhoid, when the patient needs bed baths, it will be necessary to know how to prepare the bed. In cases of extreme temperature a cold sprinkle-bath is often advised. To prepare for this use a large rubber blanket or oilcloth. Lay it flat on the floor and cover it with a sheet. Roll lengthwise. Place it on the bed, unroll toward the patient, tucking it carefully under him, when, with very little trouble, it can be reached from the opposite side, and the bed thus covered. Then roll two blankets lengthwise, putting one on either side under the rubber sheet. A pillow now placed at the head and foot, under the rubber, will form a very serviceable bath tub. After the patient has had friction applied as per direction above, wet a sheet in tepid water, wring fairly dry, and wrap the patient from his neck to his feet, keeping the hands under the cover. The cold compress is already on the head. Take an ordinary whisk broom and a large bowl of water, first without ice, then gradually adding ice till the bath is finished. Dip the whisk broom in the water and quickly sprinkle the patient from head to foot. Continue this from ten to fifteen minutes, according to the physician's direction, absorb the water with a large sponge or bath towel, remove the wet linen and rubber sheet quickly, but gently, and wrap the patient in a soft blanket. Take the temperature a half hour later and you will usually find that it has dropped from one-half to a whole degree. A little experience with

this bath and it will do very well instead of an ice water tub in typhoid cases.

An evaporation bath is given by sponging the patient with tepid water, leaving the body moist, and gently fanning till the moisture evaporates. Repeat for fifteen or twenty minutes. Care should be exercised to prevent a draught reaching the patient when he is uncovered. This can be accomplished by improvised screens.

In sponging, a piece of gauze or bleached cheese cloth is preferable to a sponge. The gauze can be shaken a few times and gets very cool. This laid on the patient for a moment, shaken again and repeated, serves to cool the skin, and feels very grateful.

An alcohol sponge is given by exposing but small portions of the patient at a time, giving friction to the exposed parts until the blood circulates freely, then sponging with alcohol and water, equal parts. Pure alcohol should not be used for bathing, as it acts as an astringent on the pores. If alcohol is not at hand, a teaspoonful of salt to a quart of water will serve as a very good substitute.

Vapor baths are sometimes desired in the home where there is no bath cabinet. A simple and convenient way to arrange one is by running a tape or string along the edge of a bed blanket, and gathering it about the patient's neck. Place a basin of hot water under a chair, seat the patient, protecting his feet and legs from danger of being scalded. Draw the blanket around the chair. Have ready a few pieces of brick or small stones, which should be placed in the fire until very hot. Drop them, one at a time, into the basin. Keep the steam inside the blanket, and a profuse perspiration will soon take place. In cases of severe colds, grip, or asthma a tablespoonful of tincture of benzoate added to the water will prove beneficial. Much care should be taken that the patient does not take cold after a vapor bath. Roll him in a dry blanket and cover well, letting him cool gradually.

An improvised Sitz bath can be arranged by the use of a small washtub in the absence of a Sitz bath tub. Fill the tub one-third full of water, about warm enough for a bath. Have the patient sit in the tub with feet on the floor, using a folded bath towel to protect his back from the edge of the tub. Pour into the tub warmer water gradually till the bath gets hot as he can endure, having sufficient water to cover the hips. This bath is valuable in sciatica, kidney, and bladder troubles.

Cold sponge bathing, in the absence of an opportunity to take a cold plunge in the morning, is most valuable to every one. It helps to

ward off colds, reduces susceptibility of tonsilitis from draughts, and refreshes the bather at the same time. A cold sponge and a brisk rub down immediately upon rising in the morning starts the blood bounding through the veins and helps keep the doctor farther away.

CLEANLINESS.

Much care should be given to cleanliness in and about the sick room. That uncleanliness is sure to spread contagion has been proven times without number. Where due care has been exercised, even virulent infectious diseases have been confined to a single member of a household. On the other hand, where soiled linen and clothing have been allowed to stand without disinfecting, where cleanliness of the patient and the nurse, or those in charge, has been neglected, whole families, and even communities, have had to suffer with such diseases as typhoid and diphtheria.

One nursing or caring for the sick should bathe frequently. He owes it to his own health, and also to the sensitive feelings of the patient. People will no longer tolerate the "Sairy Gamp" nursing of Charles Dickens's creation. A nurse should be dressed plainly, preferably in some wash material, hair kept nicely in order, hands and nails immaculately clean. This condition will act as a tonic to a patient, while an untidy, unkempt person will be so disgusting that the mere presence will act as a check to all good agents. It behooves the nurse, then, to first look after her own person.

Many patients will think that they are too ill to be bathed. This, however, is simply an erratic idea. Every morning and evening the face and hands at least should be carefully bathed, the mouth and teeth carefully cleaned, and the hair brushed. Even in cases of unconsciousness, there can be no excuse for not bathing the patient. It is refreshing, beside being necessary to the health.

We would earnestly impress upon the nurse the importance of the care of the teeth, tongue, and roof of the mouth of fever patients. Unless carefully watched and frequently cleaned they will become filled with sordes, hardening, cracking, giving the patient no end of annoyance, and the breath a foul odor. Have the patient rinse the mouth well with boracic acid solution, or a mild salt solution. Do not use soda, as it dries the membrane, and will cause the tongue and lips to crack. With

a piece of gauze the mouth can be freed from all impurities, and the gratefulness of the patient alone will be sufficient reward. Oil the lips with cocoa butter or cold cream.

The nose of fever cases, especially typhoid and pneumonia, should be carefully watched, as the excretions become hardened and soon obstruct the nasal passages. When necessary, the nostrils should be oiled with a bit of olive oil. Do not allow the patient to pick at his nose, as a perforated septum, or even worse results, may follow. A thoughtful nurse will watch out for all these little things, which amount to much in the long run. It is in just these minor details that the trained nurse proves valuable, and those who have had no training cannot afford to ignore them.

Always keep things free from dust in the sick room. This can best be done by going over everything lightly with a cloth dampened with a weak carbolic solution, or some other disinfectant. The dust should be removed at least once a day, as it will do much to prevent the dangers from disease germs floating about the house.

All bed clothes, including the patient's bed robe, towels, etc., in contagious or infectious diseases, should be immersed in a carbolic solution. This will not injure nor stain the linen, and is a good germicide. They can be put in a boiler and quickly heated to the boiling point, but under no circumstances should they be allowed to stand without thorough disinfecting. (For other modes of disinfecting see page 164.)

In typhoid the bed utensils must each time be thoroughly cleansed and disinfected, for, be it remembered, that it is from the urine and stools that the disease is spread. Watch the bed linens carefully, and allow no spots to remain after the urinal or bedpan has been used. If small stains are found they can be disinfected with a solution of bichloride, without removing. Always bathe the hands of the patient after the bowels or kidneys have acted.

To purify the air in the sick room, joss sticks, ground cloves dropped on a heated shovel or stove cover, or burned coffee, will prove agreeable. The better way to change the air is to close the sick room door, open the windows in the adjoining room for a few minutes, close them and open the doors of the sick room again, when pure, fresh air will take the place of the foul. Chloride of lime used in sick room utensils will aid in preventing the spread of the disease. Plenty of boiling hot water is another good agent.

Vapo-cresoline, burned in the halls or at the entrance of a sick room,

is an aid in keeping the disease confined to one room. In cases of diphtheria, it is well to vaporize formalin or formaldehyde, in the kitchen and other living rooms after the family has retired.

All sinks, drains, closets, and lavatories should be kept scrupulously clean and disinfected. The nurse owes it to her own health, as well as to others, that no detail be overlooked where care and cleanliness are concerned.

APPLICATIONS OF HEAT AND COLD.

The use of hot and cold applications in relieving pain dates back as far as history can take us. Their many uses, or therapeutic values, were then little realized, and it is practically only a few years since an intelligent use of these important agents was reduced to a science. Formerly all pains, inflammations, and congestions were treated with a hot pack, regardless of cause, location, or consequence. Hot applications to the head to cool a fevered brain, hot applications to the chest to reduce congestion in pneumonia; in fact it was thought anything cold meant death to the patient. It is only a few years that typhoid patients, burning with fever and dying with thirst, have been allowed ice and cold water, the one great factor used to-day for their recovery.

It stands to reason that cold, sensibly applied, will tend to reduce temperature, prove more grateful to the patient, and gain the end desired, where heat would but aggravate the disease. The question is when and where to apply heat, and when and where to apply cold. Should they both be applied at the same time? Common sense and a scientific knowledge of their effect will help us to decide.

First, in applying both heat and cold to the body, rubber water bottles are indispensable. They keep the bed and patient dry, and hold the heat or cold longer than the pack, and are in every way to be preferred, except where some medicinal agent, as turpentine, mustard, or ginger, is desired to act as a counter-irritant.

In cases of injury to the head or spine, a bottle of ice water placed against the back of the head and neck will tend to reduce delirium, or brain fever. At the same time use a hot water bottle at the feet; also for the hands, if they are cold.

In an attack of appendicitis, or any inflammation of the bowels, cold applications are to be preferred. They will allay the pain, reduce the temperature, and quiet the patient. An ice water coil is the proper

apparatus for applying cold to the abdomen, it being light, and the constant stream of ice water running through keeps it cool.

In pneumonia, where the physician desires cold applications to the lungs, it is not usually convenient to apply an ice jacket in the average home. Several water bottles half filled with ice water and frequently changed, if packed around the patient's chest, will do very well. When hot packs are ordered, or desired, the same mode of treatment may be followed with the use of hot water, every care being exercised to prevent burning the patient.

When hot packs or fomentations are ordered old flannels folded into large squares are to be preferred. By sewing the ends together and inserting a stick at each end they can be wrung out very hot, without injury to the hands. One surface should be cooled before applying to the patient. Abdominal packs are frequently used to reduce gases, etc. When the patient seems excited and nervous from the hot applications, a cold water bottle on the back of the neck, or a cloth wrung out in ice water placed on the forehead, proves soothing and quieting.

Poultices should always be applied warm or hot, as the chief object in using them is to hasten the decomposition of the tissue.

Extremely hot baths in cases of languor, fatigue, depression, or a general aching of the body will prove a great relief. Fill the bath with water as warm as one can get into, then allow the hot water to continue running in till the bath is as hot as the patient can stand. A few ounces of sea salt added to this bath will increase its value. A brisk rub down with a coarse towel, and a good night's rest, will often prevent a serious illness.

People in general do not use enough hot and cold water, either internally or externally. A large quantity should be drunk every day to increase the sewerage of the system, and copious quantities used in bathing to keep the sewer gates open and the body in a healthy condition.

FEVER NURSING.

Probably the most important division of nursing is fever nursing. It is then, if ever, the patient's life depends on the eternal vigilance of the nurse, and it is then that the nurse from the first owes herself proper food, rest, and exercise in order to endure the fatigues which naturally attend a long illness. Self-sacrifice is not always unselfishness. The nurse who best cares for her own health takes best care of her patient.

Fevers do not necessarily mean high temperatures. People may run high temperatures and still not have a fever. A sudden chill, a slight cold, or an attack of indigestion may send the mercury up two or three degrees, but, if it is nothing more serious, a second reading of the thermometer a few hours later will find the temperature fallen back nearly to normal condition.

In fevers the temperature goes up and goes down again, but is sure to rise, probably a little higher each time during a certain period. For instance, typhoid fever is caused by the poisons produced by colonies of microscopic germs in the bowels, which, strange as it may seem, live their lives in a series of sevens. This is called an "expectant fever," it being expected that the germs will have spent their force in fourteen, twenty-one, or twenty-eight days. This fever does not usually run more than four weeks, unless the patient becomes reinfected, and a new colony of germs begins work. The old idea of "breaking up" typhoid fever has long since exploded. Now, where we feel confident we have a case of real typhoid we settle down to work, hoping for the crisis in fourteen or twenty-one days, and in the meantime bending our energies to keep the unnatural fire from consuming the patient, by natural and artificial means of feeding it, and radiating the heat by means of baths, etc.

In cases of this nature, where trained service is not available, it is of vital importance to make the next best choice, by selecting one whose personality will adapt him to the work, and to this one give right of precedence. In order to make a success in the sick room one must have a kind nature, at the same time be firm and decisive where necessity demands. One should be ready to obey the physician's orders implicitly, no matter what theory or reason he or she may have in regard to the matter, assuming from the beginning that the physician worthy of your employment has a superior knowledge in all matters pertaining to the disease and its treatment. There can be no liberties safely taken in fever nursing. It is far better to unflinchingly carry out the orders as nearly as possible in the manner prescribed.

It is in these cases that the chart, baths, etc., already described, play an important part. Accurate, intelligent reports enlighten the physician as to the true condition of the patient; they are the index to complications which are almost sure to arise in one form or another.

Continued or expectant fevers are usually attended with more or less delirium, especially when attended by high temperatures, or the patient is of a nervous nature. In these cases there is usually low mut-

terings when the patient is in a restless sleep, and on waking they fancy they see people or objects which greatly excite them. It is better never to leave patients in this condition alone, even for a moment, as they may leave the bed, jump from the window, or do themselves serious injury almost in an instant. It is better to agree with them, even see things with them at times, soothe them by bathing the forehead, and gain their confidence in every way. This will soon dispel all fears, and your very presence will drive all disturbing visions from the bewildered brain.

It is vastly important that the patient be fed, but the diet will doubtless be milk, or some prepared liquid food, for many days. Until the crisis the patient will be satisfied with this restricted diet, but once the temperature drops and the fever turns, the craving for food is usually so great as to make the patient's appeals almost heart rending. Now is the time when gentleness must be combined with unquestionable firmness. Five to seven days must usually elapse before the first morsel of solid food can safely be taken, and then in such insufficient quantity at first as to be only aggravating to the starving convalescent. However, to disobey the physician now will likely undo the good work already done, and most undoubtedly cause the death of the patient. It is better to withstand the pathetic appeals than to let your tender heart be touched to the extent of yielding. Practically, the most important part is played after the fever has abated.

During a continued fever many complications are likely to arise, among them hyperstatic pneumonia, which comes from lying in one position too long; pleurisy, caused by a slight cold, indigestion, or it may arise from lameness of chest caused by patient raising himself in bed. Hiccough is one of the worst complications, and fortunately does not frequently occur. Of course, in typhoid there is always danger from perforation of the intestines and from peritonitis.

Much attention should be given to the condition of the bowels. Nurses are indirectly responsible for much of the trouble caused by the inaction of a patient's bowels and kidneys. That they move freely is of grave importance, and if they are allowed to become constipated and inactive, the great sewer through which the substance of the poisonous matter must pass be clogged, there will be no end of trouble: a rise in temperature, a toxæmia from intestinal absorption, and a greater liability to perforation. Such conditions should be reported to the physician, who will look to the matter at once. A careful watch should be kept of the stools to see if the food is being properly assimilated.

The importance of cooling baths is in every way evident. By proper friction to bring the overheated blood bounding to the surface and cold water applied to cool the surface, it can be readily seen that the intensity of the fire will be reduced for a time. Hence, as has elsewhere been urged, baths cannot be too faithfully given.

In the lesser fevers much the same line of nursing and attention is necessary. A frequent change of well-aired linen, thorough cleanliness about the patient and the house, systematic methods of "doing things" for the patient, all play an important part.

In all cases of severe illness, rest and quiet are absolutely necessary. A fever patient is in no condition to receive visitors; even the members of the family, not strictly obliged to assist in giving necessary care, should be excluded from the sick room for the patient's good. Where there is no trained nurse in the house this rule is likely to be overlooked, but in every case should be rigidly enforced.

General principles, only, can be laid down for general nursing, since cases and circumstances will not admit of fixed rules. Helpful suggestions—suggestions born of a long and varied experience—can only be offered, and the rest is left to the thoughtfulness and intelligent observation of whoever undertakes this most important work, whether from force, duty, or love. With the appearance of new symptoms we must look for complications. Quick wit, keen observation, and experience will do much to check many of them before they get settled.

For instance, common sense will teach us that to prevent hyperstatic pneumonia a patient should be occasionally turned in bed so that he does not rest continuously on his back or either side. That every caution should be used to prevent a patient from taking a direct draught, and in case of pleurisy that absolute quiet is necessary. If pains are extremely severe bind the chest tightly with a towel or laced jacket, which will diminish the chest action and reduce the pain.

Thus will one need to be ready for any emergency. To be cool, collected, resourceful, is primarily essential to every one entering a sick room. Nervous, irritable, helpless attendants are worse than useless and should keep within their proper sphere.

SURGICAL NURSING.

It seems practically unnecessary to say much on the subject of surgical nursing. Most cases of major importance will be taken to the

hospital, or a proficient, trained nurse will be necessary if the operation is done at home. Minor cases, however, may be treated in the home, and a general idea of what to do and what not to do may prove of value.

Since all disease is based on a germ theory and all cures on an elimination of the cause, we must then admit it is necessary to destroy all germs or prevent them from coming in contact with clean wounds. A surgically clean wound will heal by primary intention; but should disease germs enter we shall find that complications will soon arise in the form of pus, decomposition or gangrene, and blood poisoning. Hence, the importance of keeping all cuts, bruises, etc., from infection. A simple cut or bruise on the finger is practically in more danger from infection than the wound from the amputation of an arm or leg simply because less precaution is taken. We have seen most serious cases of blood poisoning from a simple bruise of a finger nail, which was thought to be of too little consequence to have proper treatment.

In cases of cuts and bruises be sure that the basin or bowl in which the part is to be bathed has been thoroughly scalded with boiling water. For bathing wounds use only water that has been boiled, to which has been added a small quantity of carbolic acid, creolin, or some other germicide. In case there is no germicide at hand a spoonful of salt will answer very well. Only clean bandages that have been baked or soaked in an antiseptic solution should be used as dressing. People often remark that severe wounds are sometimes dressed with soiled handkerchiefs or other linen and do not become infected. True, they do not *always* become infected. Nature provides an antiseptic fluid in the blood, which goes a long ways to exclude germs. But surgical cleanliness, so far as is possible, is always advised.

In case of important surgical dressings, of course, a surgeon will do the work, or directly supervise it. In cases of accidents or emergencies it simply remains for those at hand to see that due caution is used to prevent infection before the surgeon arrives. (For Accidents, etc., see page 571.)

CARE OF CHILDREN.

It is a lamentable fact that small children do not always receive the careful attention in sickness that their elders demand. Because a child is young and unable to talk or make itself understood there is all the more reason that the mother, or those into whose care the infant falls, should make a study to discern its wants and requirements.

We believe that most small children suffer from thirst and especially when they are ill. How can one who is nursing a child which is running a temperature or burning with fever so far forget the delightful sensation of cool drinks as to fail to give the little sufferer a spoonful of water every now and then? Will it not prove as refreshing to the tiny mortal as to a man? And again we have often found that no thought is given to quiet for the sick baby. Doors are allowed to bang, the family bustle about and talk in loud voices, when if the little face be watched shadows of pain will be seen to pass over it with every sound. Yet, it can make no intelligent outcry against it.

Babies need quiet, careful, thoughtful nursing even more than an adult. They need liquids in small quantities, but frequently. Their tiny brain needs the consideration that older people demand, and it is our duty to see that they have it.

At the time children are teething they are usually fretful and peevish. The little gums are swollen, the stomach gets bad, and the child is ill. Many times convulsions occur at this period. In that case place the child in a very warm bath, chafe the hands and feet, massage the body quickly and roll in a warm blanket. A physician should be called at once, who may find it necessary to lance the child's gums, or, at least, will leave something for local application to alleviate the pain. Whenever the child gets fretful and tired a warm bath will be grateful and a refreshing sleep will naturally follow.

If all babies and small children should be given a general massage at bedtime there would be less sickness, fewer pale, weak ones, and a marked decrease in the number of deformed boys and girls in the world. Ten or fifteen minutes given to the little one at bedtime is time valuably spent, for it will give health, strength, and a fine physique to the child and prevent many of the petty illnesses.

Many mothers keep babies in a room that is too warm, or covered so heavily that the tiny creatures cannot move. This should be avoided as it will be likely to deform the little limbs, cause curvature of spine and general weakness. Place two or three water bottles partly filled with warm water about the child and cover lightly and give the little one fresh air.

VISITORS, FLOWERS, ETC.

One of the worst features of home nursing is the lack of discipline in the sick room. Patients are allowed to talk at night, often spending

the entire night in sleeplessness, and then sleeping nearly all day. Have it understood that the night is designed for rest, not only for sick people but also for the other members of the household, and that it is a duty we owe to the family to be as quiet as possible. This will soon have its effect, and, save on rare occasions, there will be no more trouble in this direction.

Another thoughtlessness on the part of those intrusted with home nursing is allowing visitors in the sick room. A patient will strive to be gracious and cheerful, appreciating the good intention of the caller, while at the same time his nerves are keyed up to a high pitch and there must necessarily be a reaction. Probably a sleepless night will follow, a depression of spirits and a rise in temperature, all of which will cause uneasiness. It is far better to exclude every one from the sick room save those in attendance.

A careful nurse will not ply a patient with a multitude of questions nor allow him to carry on long conversations. All these things are a mighty help toward the desired end and cannot well be overlooked. Do not ask a patient if he will have this or that thing done. If it is the proper thing to do go at it without troubling him. It is a matter of business and should be treated as such. Do not encourage a patient in wanting constant attention. There is quite as much danger from overdoing as there is from doing too little. Sick people need rest and quiet. They are Nature's great restorers.

Flowers should not stand in a sick room. Roses, violets, and lilies all have a heavy odor, which soon becomes nauseating. Flowers are beautiful and very few patients are unable to appreciate the sight of them. When flowers are sent by anxious friends they should be taken to the patient for a few minutes, if his condition will admit, otherwise even the knowledge of their having been received should remain a secret with the cards or names of callers, until convalescence is established, when the joy of knowing that friends have been thoughtful will be sufficient and no risks taken. It is always better to conceal things from patients that cannot benefit them. What they do not know cannot harm them and to keep them posted on trivial matters gives them material for anxiety and unnecessary concern.

WHAT NOT TO DO IN THE SICK ROOM.

Do not revolutionize conventional customs in a moment. Make changes gradually without annoyance to the patient.

Do not annoy the patient with useless questions nor carry on long conversations. Keep the sick room quiet and restful.

Do not allow visitors or other disturbing influences to enter the sick room. Keep out all news of exciting nature, business matters, or anything likely to worry or annoy the patient.

Do not allow soiled towels, glasses, or other utensils to remain in a sick room.

Do not neglect to bathe the patient every morning and evening.

Do not get excited in emergency cases. Be calm and collected and use your knowledge to good advantage.

Do not give alcoholic stimulants to people with bleeding wounds or hemorrhages. Alcohol causes an increase in muscular action of the heart and consequently a greater flow of blood.

Do not lose your dignity or temper before a patient. Be pleasant and forceful, sympathetic, but unflinching in duty. It is the only way to be successful.

Do not try to deceive the patient or the physician. You will but deceive yourself and lose the confidence of both. Be willing to admit a fault or a mistake and do your best to make amends for it.

Do not sing, whistle, hum, chew gum, rock your chair, or rattle the pages of a book or paper. Sick people's nerves are sensitive, and, though they may try to bear it rather than object, it is very trying and exhausting.

Do not make the patient feel under obligation to you, yet at the same time do not let him get the idea you are his slave. Friendly relations will prove a great help in the work.

Do not neglect little things. Details count in long illnesses.

Do not bustle in and out of the room more times than necessary. Make every step count.

Do not always sit in the room or watch the patient unless he is delirious or for other reasons requires constant watching. It makes most patients nervous to be watched like a convict. Sit just outside where a low call or a slight movement will attract you.

Do not neglect your own meals, rest, and recreation. Remember the best nurse is the one who takes best care of herself and thus fits herself to give best care to a patient.

Do not think a little knowledge of nursing sufficient. Study and become competent to do the work well.

CONVALESCENCE.

Most people do not realize the necessity of a complete recuperation from even a light sickness. The convalescence period should be watched and the patient carefully nursed and nourished that no serious complications may arise and the result be impaired health for life or an untimely grave.

Convalescents are generally weak and emaciated, with ambition far exceeding their strength and judgment. Such should be carefully curbed in their desires and an ever watchful eye kept on them to be sure they do not take undue advantage during the absence of the attendant.

Now is the season when a careful, nourishing diet becomes a study. The stomach must not be overloaded, nor filled with indigestible foods, for it must be remembered the whole system is weak and cannot be overworked. Small quantities served regularly and daintily, pure, fresh milk, carefully selected fruits will soon bring back strength and color.

Bathing should not now be neglected. A tepid bath and brisk rub with a turkish bath towel, every morning, will freshen the skin and send the blood bounding along for the day. And this is the time when massage plays an important part. A thorough, scientific treatment before retiring for the night will rejuvenate the nervous system, enliven the muscles, rest the patient, and give the entire body exercise which it so much needs and which at this time it can get in no other way.

If the weather permits, a ride or walk in the open air and sunshine is of inestimable value. Let Nature do all she can toward the restoration of health. The trees and flowers, the hills and streams, present views which are a tonic for the heart and mind, and the fresh air, the smell of the earth, and the glow of nature give new hopes, new ambitions, and desires to get well.

Do not let the convalescent get overtired. It is such a relief to leave the bed he often wishes to sit up too long at first. This should not be allowed. It is better to rest for a while than to tire the nerves and muscles, and risk a relapse. Again, be careful of draughts. Do not allow the patient to sit before an open window with a door or another window ajar in the room. Give him all the sunshine possible and make his surroundings so cheerful that he does not become depressed. Visitors may now prove their good will, few being admitted at first, and at no time a regular reception to be given. Use tact, judgment,

and common sense now as during the illness. Do not think the danger is all past till the recovery is complete. A thorough and proper convalescence is slow. To hurry it beyond reason is to undermine the health, and nothing will be gained. Make haste slowly. An extra week or two in which to recuperate may mean a long life of happiness, while injudicious treatment may mean impaired health and years of misery.

MASSAGE.

Introduction.—That there is an unjust prejudice against massage and those who practise it is realized and lamented by all legitimate masseurs. That the treatment has been abused and the profession scandalized by unscrupulous impostors must be admitted, but it does not lessen the value of the treatment. All professions have quacks, who, for a time, injure those who do an honest business, but in the end they are themselves the injured. That massage is used the world over in the treatment of disease and to preserve physical health should be sufficient indorsement. The world's best physicians and surgeons recognize in it a vast benefit to a large class of patients and are each year recommending it to greater numbers.

It is only those who are ignorant of the treatment and its benefits that are ready to condemn it. Every one who has been confined to a sick bed remembers how comforted and rested he felt after having his aching back rubbed for a while, or how soothing and refreshing it was to have the feet and hands chafed when he felt tired and sleepless. That was a crude form of massage which proved an agreeable agent. How much more beneficial, then, would be a knowledge of how to do the work in a practical, scientific way!

Massage is a treatment whereby the muscles, nerves, and blood vessels are scientifically manipulated by the means of systematic rubbing, rolling, kneading, moulding, thumping, squeezing, slapping, and whipping until the body has received the necessary exercise and the blood is hastened along its course, thus rejuvenating the entire system.

Space will not admit of a long discussion of its uses and abuses, nor is this article intended as a text-book on Massage. It is written with the idea of giving to the layman a fair idea of the treatment, that when professional service is not available he may be able to render practical service where it is required.

Its Uses and Benefits.—As has already been stated, massage is beneficial in restoring and preserving health. Certain diseases require an enervating exercise which the patient's lack of strength will not permit. People, like lawyers, bookkeepers, stenographers, and others who lead sedentary lives and do not have time or energy to take proper exercise, require the treatment to keep themselves in good physical condition. For that tired, lifeless feeling, nervousness, sleeplessness, constipation, sciatica, contraction of cords and muscles, paralysis, stiff joints, and many other diseases and complications to which the flesh is heir, there is no greater or better remedy than thorough massage, given by one who is intelligently capable of administering the treatment.

We cannot go into detail in describing the differences and similarities of different systems. A general description will suffice since they all tend to the one great end, exercise, rejuvenation, and development. The Swedish system is vigorous, bracing, and in its true form can be given only to strong, muscular, hardy people like athletes. It exercises the muscles to the bone, giving to the subject at each treatment the benefit of an eight mile walk without the fatigue.

The German system is less vigorous and is usually given in connection with baths. This treatment is suitable for the average patient who has not been reduced to a weakened condition by a long illness. This treatment can also be given to fracture cases with gratifying results after the bones have become firmly knitted together. Practically speaking, German treatment is a modification of the Swedish system, omitting Swedish movements and substituting the baths

The French system is also called the Beauty treatment, and is a delicate manipulation, designed especially to keep the skin free from wrinkles and blemishes. It is given mostly to the face, neck, arms, and hands, and is a wonderful developer and producer of beauty. The fact that so many Parisian ladies remain beautiful even to old age is greatly due to beauty treatment and the excellent care they give to the skin. French massage is not particularly beneficial to invalids, save as it gives a refreshed feeling to the skin.

When to Give Massage.—In giving massage treatment there are several things to be thought of and considered. First, the room should be warm and free from draughts. Second, the patient should be in a condition to receive the treatment. Owing to the tender condition of the bowels in typhoid it is extremely dangerous to give general massage. In case of a very weak heart the increase of circulation from vigorous

massage would be disastrous. Hence, it is necessary to have some practical knowledge of diseases or consult a physician.

In case a subject perspires freely give a cooling sponge bath and use a little toilet powder. Do not massage a moist skin. Where the patient is covered with a heavy growth of hair, as on the arms and legs, it will be necessary to use extra precaution or repeated treatments will cause irritation at the roots and abscesses will form. Do not rub these parts in the opposite direction from which the hair grows. Do not massage over the breasts or navel (umbilicus), use a circular motion from left to right in these sections. Do not be afraid of getting too near the bone in deep muscles, nor use too much force over the bowels and vital organs.

The old idea that in rubbing a patient one should always rub toward the end of the fingers and toes is quite wrong. The fact that the veins lie near the surface and carry impure blood back to the heart and thence to the lungs to be freed from its impurities, is sufficient reason for rubbing or massaging toward the heart, thus hastening it back with all its poisonous load. Hence, in giving massage treatment, always work toward the heart in circular movements from left to right.

To produce or induce sleep begin with the head, then massage the arms, the body, the legs, and finish with the feet. This brings the last great rush of blood away from the head and leaves the brain cool and quiet. Downward strokes in massage, as in hypnotism, have a sleep-producing effect, while upward strokes, bringing the rush of blood to the head, have the effect of making the patient wakeful.

Massage should not be given immediately after a hearty meal nor on an empty stomach. It is better to wait at least an hour after a full meal, and if massage is given in the morning it is better that the patient take a glass of milk, an eggnog, or something light before the treatment is given. Usually the patient will wish to remain quiet for half an hour or so after having massage. This is to be encouraged as it lessens the danger of contracting cold and the subject will feel more refreshed for the rest. Expose only the part being treated and cover this surface before beginning a new section.

We do not advise the use of creams or so-called skin foods in the general treatment. Oils grease the surface, prevent the friction and transmission of vitality of the masseur, clog the pores, and are useless save in cases where they are advised by physicians for throat and pulmonary troubles. Then the part should be first thoroughly treated

without the oil, which may later be applied and massaged in. A clean, fresh skin treated with the clean, bare hand of the operator will prove of greater benefit than any applications.

The question is often asked, "Is it necessary to expose the body? Cannot the treatment be successfully given through thin clothing?" To this we would say that treatment *can* be given with value to the subject through clothing, but the mere fact that the hand of a strong, robust, healthy manipulator transmits more or less of his vital energy is sufficient reason that clothing should be discarded. It is never necessary to expose a patient enough so that the most sensitive need object to the treatment from a first-class masseur. But, if one is to have treatment through clothing or a blanket, why not resort to purely mechanical massage? Some masseurs with an enviable reputation refuse to give treatment with the bare hand, claiming too great a loss of vitality through transmission by contact. Such operators wear rubber gloves.

Importance of a System.—From the foregoing statements of facts it will be readily seen that it is essential that there be a system for giving massage treatment if one would have beneficial results. It has been our experience that no one system will apply to all cases; that it is necessary to modify any system or perhaps combine the several as the case at different stages demands. We would not give to a patient, emaciated and weak from a fever or long illness, a vigorous Swedish treatment at the beginning of his convalescence. Such a treatment to a well, strong man, if he were not accustomed to massage, would bruise his muscles and make him so lame and sore that he would think he was the victim of a prize fight. On the other hand a gentle, easy treatment would be of no great benefit to a football player or athlete. One must exercise reason in the case. Begin lightly with delicate cases, increase the pressure from day to day until the muscles become accustomed to the treatment. Later, as the muscles become hardened, rounded, and full, it will require a great deal of strength to give a treatment that will be beneficial or satisfactory to the subject.

Always begin the treatment in the same manner and take each manipulation in its turn. A raised couch or table, narrow enough to enable one to work handily from either side and high enough to relieve strain from the operator, is necessary. Have patient lie flat on the back with muscles all relaxed. In treating the abdomen have patient draw knees up as it relaxes the abdominal muscles. When one side has been treated

the patient will lie face downward while the muscles of the back and buttocks receive treatment.

How to Give a Massage.—Beginning with the head, rub the scalp with the finger tips in a brisk, energetic manner to start circulation there. With a rotary motion massage the face, beginning with the chin and working upward and outward toward the ears, till a healthy glow appears. This is not intended for a beauty treatment and five minutes is sufficient for the head and neck.

Next raise the arm and from the tips of the fingers stroke to the shoulder a few times, to start surface circulation and prevent chilliness. This should be done in exposing any part of the body. Beginning with the tips of the fingers rub each joint separately with a circular movement much as you would in putting on a new glove. Working toward the palm, massage each joint, following the palmar bones to the wrist. It is here that the long muscles and real work begins. (1) With the arm grasped with the two hands use the thumb side in a parting motion, as if the muscles were being divided or parted from the bone. This should be done the entire length of the arm, or in any long muscles. (2) Next, wring or twist the muscles much as you would wring a wet sheet, the hands acting in opposite directions. This movement drives the blood with force from the muscles and arouses the nerves to a keen sense of being. (3) Knead the muscles next, by placing one hand on the underside and with the ball of the thumb and a grasp of the hand roll the muscles with a slow rotary motion from left to right. This should be thoroughly done on every muscle, following the general direction of same. (4) Next, begin with the end of the fingers, with quick, firm grasp squeeze the muscles, hastening the blood on toward the heart. By this time the skin should be in a healthy, pink glow; if not repeat the treatment. Massage the elbow joint carefully, leaving no spot unexercised. To increase the glow and bring the blood to the surface whip with the fingers by giving them a quick, sharp shake, like the snapping of a whip, flaying the patient not too severely. On deeper or larger muscles this should be preceded by a hacking motion. Open the hand, extending the fingers, and use the outer side of both in a quick chopping or hacking motion.

The shoulder and hip joints should receive careful attention, working deeply, getting near and around the joint until it is thoroughly treated.

In treating the chest lay the hand flat, giving greater weight to the

thumb side; use a twisting motion from left to right, avoiding pressure over the nipples. Next, grasp the flesh between the thumb and index finger near the short ribs, and with a creeping movement roll the muscles upward. Repeat the treatment several times. A healthy red will usually quickly appear on the chest.

To treat the abdomen have the patient draw the knees well up, relaxing the muscles. Place the hands flat on the bowels near the hips, and with weight from the wrist roll the hands forward to the tips of the fingers. This must be done firmly and gently so as not to injure the patient. Continue the rotary motion here as in other sections. Work well over the liver on the right side. By a little experience the bowels can be most thoroughly and deeply treated without causing the patient annoyance, and with great benefit in cases of torpid liver, constipation, etc.

Treat the legs in the same manner as the arms, using greater force in case of deeper muscles, and going over these parts several times with the same treatment. This is necessary on account of the greater depth of muscular tissue, larger blood vessels, etc. Large, deep muscles will stand a great deal of thumping with the fist, hacking, and slapping with the open palm.

In treating the back, always begin with the back of the head and neck, massaging thoroughly at the base of the brain and along the spinal column. Here lie the nerve centers and it is necessary to give them a good stirring up, to put new life into them. Treat the back much as the chest is treated, rolling the muscles well between the thumb and finger, and with a circular motion. Flay the spine till it gets decidedly rosy.

When the entire body has received treatment some simple Swedish movements will be beneficial and refreshing. Beginning with the hands rotate each finger from right to left four times, then in the opposite direction four times. Treat the wrist in the same manner, raise and straighten the forearm, the patient using a little resistance. Extend the arm, grasping the wrist and elbow. Move it in a large circle four times one way and reverse the order. The feet and legs may be treated in the same way. This makes a very satisfactory finish to the massage treatment and will prove very grateful to the patient.

In treating special cases a general knowledge of massage is necessary. The better one understands anatomy and is able to follow the direction of the muscles, the better treatment he will be able to give.

Forty-five minutes is required for a general massage, and will usually be as long as the subject or masseur cares to put into a treatment.

In giving local treatment follow general rules for that section of the body. In cases of localized fluid, synovitis, local inflammation, etc., massage away from localized point. In fracture cases do not massage directly over the fracture. Massage on both sides to increase circulation and nutrition, thus adding strength to the union.

In cases where patient is confined to the bed and unable to be moved, a general, gentle treatment of all parts that can be conveniently reached will greatly rest the patient. Instead of "rubbing" a patient in the old fashioned way, treat him with genuine massage movements, which will prove more grateful and beneficial.

MASSAGE FOR SPRAINS, BRUISES, ETC.

In case of sprains, as for example when the cords of the ankle are strained or lacerated, the condition will very soon become painful, swollen, and black. Ascertain if the bones are all in proper place; if so, raise the ankle high, and massage evenly and lightly the affected part for half an hour or more, rapidly driving the blood away from the spot where it will be likely to settle because of the torn condition of the capillary cells. By faithfully massaging the joint much of the œdema will be prevented and the pain will be reduced. Bathe the joint with a hot salt solution and bandage tightly. In massaging sprains use the circular motion with the ball of the thumb, the "parting" movement to increase venous circulation away from the joint, and the tips of the fingers directly over the affected part to encourage circulation through the injured cells.

To prevent blood from settling in a bruise, massage thoroughly, driving the blood through the bruised part until a new circulation is established. Hot fomentations will assist in the removal of discoloration. After treating in this way, bind a thin piece of well pounded raw beef over the part for a few hours and there will be little annoyance from discoloration. The massaging should be done as soon as possible after injury, before the part gets sensitive to the touch.

BEAUTY MASSAGE.

It is safe to say that the majority of people do not enjoy the approach of old age and decay, and desire to prolong youthfulness in

every way as long as possible. Gray hairs are no longer considered a harbinger of old age nor do they usually detract from a person's comeliness. Wrinkles, a parched, withered, lifeless skin, flabbiness of the muscles, puffs under the eyes, sagging of the corners of the mouth and a general heaviness of the lower part of the face are the noticeable signs of years. Intemperate habits, late hours, worry, churlishness, and overwork encourage decay. Sluggishness, torpidity of the liver, and illness promote sagging of the muscles, sourness of expression, and general ugliness.

If one would retain the youthful look, one must first consider the health and habits. Nature will do her part to make all things beautiful, and while old age when sweetly attained is the glory of a life, ugly wrinkles and blemishes are unsightly to everybody. Outside the savages, who delight in making themselves hideous, there is no man or woman of intelligence who does not wish to look well. One can be proud of his person and yet not vain. Artificial beauty through cosmetics and accessories may be vanity, but to preserve the youthful, healthful vigor of the skin, the delightful contour of the face, to eradicate the signs of dissipation, fretfulness, and severity, cannot be considered vanity. In order to do this one must have a purpose and this purpose an ideal; and since ideals usually lead to loftier sentiments and aspirations, the desire to retain the beauty of youth must be most highly commended. A haggard, seamed, distorted face is not only repulsive, but elicits little sympathy from the world. No matter how the heart may have been wrung to cause the unsightly furrows on the brow or about the eyes, the world is looking for beautiful and fresh faces and will not stop to inquire if the wrinkles have come from honorable old age, or have been cultivated by a life of dissipation, ribaldry, and unhappiness.

True, the lack of happiness in certain classes produces premature signs of decay, even on the faces of innocent children. The more the pity, and the more the necessity of knowing how to cultivate beauty. Perfect health, cheerful surroundings, pure manhood or womanhood will keep the ravages of time at a long distance. This we all wish to do.

In order to keep the skin fresh, the pores must be kept open and the face frequently bathed to free it from impurities. Hot water should rarely be applied. It is better to use a tepid bath, with some pure, carefully selected toilet soap, in moderate quantity, when the skin is

oily or necessity requires. Great care should be exercised in bathing and drying the face not to injure the epiderm or outer layer of skin, leaving it rough and scaly. Under exposure to the heat of the sun's rays, the rough winds and storms will injure this delicate skin unless it is carefully treated. People who live in a cool, dry climate have the best and most easily kept complexions.

We do not recommend the general use of creams, skin foods, and cosmetics so much advertised. More or less of them are harmless and quite useless, while some are injurious. Purity of the skin by steaming and bathing is better than artificial means of opening and clogging the pores. Sometimes a cream may prove of value, as in the case of sunburn, dry or parched skin, blackheads that cannot be easily removed by steaming and bathing, etc., but generally, a clean, healthy skin will be its own scavenger.

To aid in eradicating wrinkles, rejuvenating the features, developing the muscles, assist in removing decomposed tissue and in hastening the up-building of new, a light, firm, scientific massage will prove of immense value. In order to have it prove of greatest value it will be necessary to understand the reasons for the treatment.

First, massage hastens circulation, and, since nutrition depends largely upon circulation, the building of new tissue is accelerated. Secondly, the manipulation of the muscles causes development, thus the parts most exercised will develop or fill in; hence the necessity of great care in massaging for eradication of displeasing features, such as wrinkles, double chin, suspended or flabby muscles, etc., not to increase them.

The reason for massaging the face before wrinkles appear is clearly evident. To keep the skin fresh, the circulation perfect, the impurities removed, the muscles from sagging, and undesirable features from developing is reason sufficient. Anyone can keep the face fresh by giving it a few minutes of daily attention. It is always better for a second person to massage the face, since it is easier and possibly the results are more satisfactory, though this is not absolutely necessary. A good way to do where professional service is not available, is for one to massage another's face, and in return receive a treatment. This can be most successfully done where both parties are careful and interested.

TO MASSAGE THE FACE.

Seat the subject in a high back chair with the head thrown back and the face up-turned. Wring a napkin in very warm water and

cover the face for a few minutes, repeating two or three times. Dry the face gently and the skin will be in a fresh, susceptible condition for good work. Stand at the back of the chair working from the lower part of the face always toward yourself. This will have a tendency to bring the muscles up, relieving the heavy look about the lower jaw. In massaging one's own face this should be borne in mind, that the stroke should be upward and outward toward the hair.

Begin with the chin, and, with the tips of the fingers and a light gentle stroke, draw the muscles back and up over the ear. With the fourth finger (counting the thumb as the first finger) supported by the thumb, used as a brace, massage the wrinkle across the chin lengthwise with a smooth, light, circular motion. All wrinkles should be massaged lengthwise instead of crosswise. Massage the lower lip in the same manner drawing the motion well up past the corners of the mouth.

The entire face should be massaged with this same gliding circular movement, working the wrinkles of the forehead and about the eyes well out into the scalp. Massage the upper eyelid by carefully pinching the entire surface to enliven the skin. If the eyes have rings or puffs beneath them do not massage the rings or puffs, but give special attention to the adjacent surface, getting up a free circulation away from the localized parts.

To massage the long wrinkles extending each side of the nose, hold the muscles of the cheek back until the wrinkles are smooth and then massage the seam lengthwise. Give the eyebrows a treatment following the natural curve with a circular motion upward.

In case the subject has a double chin this can be removed by drawing the fingers with slight pressure from the middle of the chin and throat outward and upward behind the ear. The exercise given for developing the neck will also greatly assist in removing a double chin. After finishing the treatment bathe the face gently and dry carefully.

In case of hollow cheeks, sunken eyes, etc., a pinching of the muscles and drawing them out with the five fingers is beneficial. Suction cups, which are recommended for this purpose, can also be had at a drug store. They are inexpensive glass cups with rubber bulbs and are excellent for developing a thin lower face.

Place the cup firmly on the middle of the chin, when the edges will attach themselves to the skin. Work the cup upward and outward, then press the bulb and release the glass. Repeat several times. Make sure that hollow cheeks do not come from loss of teeth. This is a most

common cause of this unsightly feature. Have the space caused by the loss of teeth fitted with porcelain or other material and thus preserve the round contour.

After using creams or skin foods, be sure they are thoroughly washed from the skin. Do not allow the pores to become clogged. Do not apply cream to a moist skin unless you would have an unsightly growth of hair on the face. Do not use yellow or red vaseline on the face as it leaves an ugly, yellow stain and is also drying to the skin. Do not use alum, tannin, or other astringents on the face if you would have a soft, delicate, fair complexion.

HOW TO DEVELOP NECK AND CHEST.

There is little excuse for having a long, slim, undeveloped neck if one will give it proper exercise and attention. The same might also be said of a short, fat neck, with an unsightly double chin.

If the neck be too long, to develop it well at the base and fill it out at the shoulders and around the clavicle will tend to give the idea of shortening. This can be done by carefully and vigorously massaging the base, across the collar bone, and out to the shoulder, drawing the muscles well out of the hollows and rolling them between the thumb and finger. A suction cup or the five finger massage that is used on a hollow face will prove of great value. To assist in the development, inflate the lungs, elevating the chest and shoulders, throw the head back and roll it around the chest three or four times in one direction and reverse the order. This exercise is very beneficial and should be carefully practised. In cases of large, short, and fat necks it will greatly reduce adipose tissue, make the muscles firm and compact, and assist in removing the double chin.

To make a full, round, healthy chest, place the hands on the hips and inhale a full breath. Expel it gradually, whispering the syllable "huh." Again inhale and swing each arm in wide circle four times in one direction and reverse the order. Expel the breath forcibly after each exercise. Swing both arms as a final exercise. This, together with the massage treatment of the chest as given under general massage, will develop a thin, hollow chest into a full, round, robust one, adding not only beauty but health to its possessor.

TO MAKE THE HANDS AND ARMS BEAUTIFUL.

Nature does much toward giving every one symmetrical proportions, but through disease or lack of exercise, certain muscles are undeveloped, while muscles that are constantly worked are over-developed. This should be borne in mind in developing any part of the body.

The first care of the hands is to keep them clean and the nails properly manicured. Grimy hands and badly kept nails are enough to spoil every other beautiful feature one may possess. The hands are an index to the inner man and their care speaks in glowing though silent words of his habits.

Care of the skin must be regarded as the care of the face. The hands are subject to all sorts of hardships and it is not easy to keep the average hand always in good condition. By thorough bathing, using a soft brush and best grade of toilet soap, by the use of a cream or lotion to keep the hands from chapping or cracking where it is necessary, and daily giving them a little extra care, they need never be unsightly.

To massage the hand and forearm for development and taper, place the elbow on a table with the hand elevated. Massage each finger separately, much after the fashion of working on a new glove. Continue this to the wrist.

Place the forearm between the two palms and rapidly roll the muscles working from the wrist to the elbow several times. This will round and taper the arm to the elbow. Treat the elbow to a thorough massage and roll the upper arm as you did the forearm.

To massage one's own arm hold the hand in the same position and stroke the arm from the hand toward the elbow. This is not so satisfactory as the other method, yet in time will make a marked improvement and give it a graceful taper. Patience and time are required for all developments, but are sure to bring reward.

FOOD FOR THE SICK.
HOW TO PREPARE AND SERVE IT.

Dietetics, or the science of diet and of its regulation, plays an important part in sickness and in health. It is the prime duty of all who care for the sick in whatever capacity to see that the patient

receives proper food, properly prepared and served in an appetizing way. It is equally important, if not more so, to see that no injurious or improperly prepared food is served to the patient. There are many who are actuated by the kindest motives in offering articles of food to an invalid when they are guided by their own likes rather than by any thought of whether it will be beneficial to the sufferer or whether his enfeebled digestive capacity can bear it. Others again commit dangerous and even fatal indiscretions by their inability to withstand a patient's pleading for food which is beyond his power to digest or to retain. It is after a crisis in a disease has been reached that especial care must be taken to proceed carefully in the matter of diet. During the period of extreme suffering there is usually little appetite or demand for food, but in early convalescence a craving for improper food sets in and sympathetic friends are very prone to satisfy the desires, with very serious consequences.

Diet for the sick is often specified according to the article of food which prevails in or composes such a diet. Accordingly there is a Milk diet, a Meat diet, a Fish diet, a Vegetable diet, a Broth diet, a Mixed diet, a Liquid or Spoon diet. It is often specified by the amount of food to be given at a time. In this classification there is a Full diet, a Generous diet, a Common diet, a Subsistence diet, or one upon which a person can barely live, a Half diet, and a Low diet.

There is another mode of designating a diet, which is by stating the particular disease or condition which it is intended to meet.

A Fever diet is one made up of milk, broths, toast waters, and jellies. There is no solid food whatever, or vegetables, or fruits.

A Gouty diet prohibits meats, wines, and beer.

A Diabetic diet allows no sugars, starches, bread, rice, potatoes, fruits, or sweet wines.

A Banting diet is designed to reduce flesh and does not permit the eating of fats, cream, starchy or sweet foods, sweet wines and stout or porter.

A Convalescent diet is a light, easily digested, simple solid or liquid diet.

A Subsistence diet, such as would be given in aneurism for instance, is composed of: Breakfast, two ounces of bread with butter and two ounces of milk; Dinner, two or three ounces of bread, two or three ounces of meat, and two to four ounces of milk or of claret wine; Supper, two ounces of bread with butter and two ounces of milk.

It must not be forgotten that the original meaning of the term to nurse is "to nourish." In no way can the offices of a good attendant of the sick be so well directed as in the providing of nourishing food, well cooked, and served in an enticing, attractive way. While this attention always supplements the efforts of the physician, there are many cases in which it supersedes his attentions. Very often the good nourishment that a patient gets is of more benefit than the medicine which the doctor supplies. One of the most pathetic sights during illness, next to the sufferings of the patient, is the utter helplessness of loving friends and relatives, who are impelled by affection and sympathy to do something to minister to the needs and comfort of the sick one. They either sit by and do nothing or make pitiable, blundering attempts which only add to the discomfort.

It is not so much what is done as how it is done that counts in the sick room. And the art of waiting on the sick in an efficient way can be cultivated by anyone to the degree of making one's attentions appreciated and helpful.

Service of Food to the Sick.—Let the patient have a set of dishes for his exclusive use. This is imperative in cases of contagious diseases; but let it be so in every case. They should be the daintiest and most attractive that the china closet contains. It goes without saying that the napkin must be clean—provide a fresh one with every meal, if necessary. The china must be spotless, the silver polished, and the glass sparkling. When putting the food into the dishes, take care that cups and saucers are not so full that the contents will spill or slop over when carried. Not alone for that reason but also because the service of a large portion of food at a time not only does not attract a capricious appetite, but may lead to over-indulgence. A small service may lead the patient to ask for a second portion. There is also danger of large portions becoming cold during the slow eating of the patient. For it is important that food which is intended to be served hot, should really be hot; and that which is to be cold, must be so. The seasoning of the food is an important detail. Where the nurse knows the wishes of the patient in this respect it is easy to accord with it. Probably more salt will be desired than when in health, and less sugar. Pepper and high seasoning are not desirable.

The freshness of food must be beyond all possible doubt. If eggs are served let them be broken out of the room, so that their purity may be unquestioned. The milk and cream must also be sweet, a point that

is liable to be overlooked in summer. If there is the slightest doubt about the condition or quality of an article of food do not serve it. The only safe guide for the condition of food when prepared is by tasting it; but don't under any condition do so in the presence of the patient. Do that in the kitchen so that anything necessary may be supplied before the patient sees it.

In planning a meal for the patient, the first thing to do is to know very definitely and exactly what foods he can eat and what must not be given. Make yourself very thoroughly acquainted with the articles to be supplied. Have plenty on your list so that you will be able to supply a variety from time to time, to take advantage of the market, and to consult the patient's tastes. But don't consult the patient too freely about what he will or will not like. Especially don't do so just after he has partaken of food. None of us, even in health, care much about the next meal when we have just finished one. Besides, a little surprise in the way of something which he is known to like and does not expect will often prove most agreeable to him. Get a good list, either from the doctor or from the following pages, and then prepare and serve them in the most attractive manner possible.

Time of Feeding.—See that the patient gets his food right on the minute. This is not only important in so far as the supply of food is concerned, but more especially to promote digestion. The stomach expects a certain amount of work at certain definite intervals, and, in cases of illness, this gives rise to feelings of discomfort if the intervals are not regular. Feeding at night is a matter to be decided by circumstances. It is only in very exceptional cases that a patient is to be awakened to partake of food. If a glass of hot milk is given just before time for sleeping it will in many cases bring a sense of sleepiness and ward off possible insomnia. If a patient asks for food in the night he should get it, and it will be better if a supply is prepared, or partly so, in case of such emergencies. If too long time is taken the patient may get over the desire for it. But as it will naturally be of a very light and digestible nature it will not take much time to get it ready.

Assistance to a Patient While Eating.—When a patient is helpless it will be necessary for the nurse to render all possible assistance while food is being taken. The head must be raised, and it is important to see that the head is not turned to either side. Even a very slight turn will be sufficient to cause the food to run out of the corner of the

mouth. His clothing must be protected with a clean, fresh napkin or towel, lest the food be spilled upon it. If he is very weak he will better use a bent glass feeding tube, rather than attempt to drink from a glass. Much more food will probably be taken by this means, and the supply can be better regulated. Only small mouthfuls are to be given and care must be taken that all food is properly masticated before another mouthful is given. See that the mouth is properly cleansed after food, for when the food lodges in the corners of the mouth there is great danger of sores occurring. When the patient is feverish the thirst will be correspondingly great. In giving cooling drinks it is well to use a small glass filled with the liquid, rather than a larger glass only partly filled. There seems to be more in the smaller glassful, and the patient will generally be better satisfied with it.

Diets for various diseases:—

FEVERS.

The patient may take:—

Foods.—Soups, clear or thickened with some well cooked farinaceous substance, mutton, clam or chicken broth, beef tea, peptonized milk.

Drinks.—Pure cold water, toast water, lemon or orange juice in cold water, cold whey, all in small quantities, sipped slowly.

The patient must *not* take:—

Any solid or vegetable food or fruit, until so directed by the physician in charge.

DYSPEPSIA.

The patient may take:—

Soups.—Clear, thin soups of beef, mutton, or oysters.

Fish.—Oysters raw, shad, cod, perch, bass, fresh mackerel.

Meats.—Beef, mutton, chicken, lamb, tripe, tongue, calf's head, broiled chopped meat, sweetbread, game, tender steak.

Eggs.—Boiled, poached, raw.

Farinaceous.—Cracked wheat, hominy, rolled oats, rice, sago, tapioca, crackers, dry toast, stale bread, corn bread, whole wheat bread, graham bread, rice cakes.

Vegetables.—Spinach, sweet corn, string beans, green peas, lettuce, cresses, celery, chicory, asparagus.

Desserts.—Rice, tapioca or farina pudding, junket, custards, baked apples, apple snow, apple tapioca, ripe fruits—raw or stewed.

Drinks.—*One* cup of weak tea, coffee, cocoa, milk and hot water equal parts, or *one* glass of pure, cool water, sipped.

The patient must *not* take:—

Rich soups or chowders, veal, pork, hashes, stews, turkey, potatoes, gravies, fried foods, liver, kidney; pickled, potted, corned, or cured meats; salted, smoked, or preserved fish; goose, duck, sausage, crabs, lobster, salmon, pies, pastry, candies, ice cream, cheese, nuts, ice water, malt or spirituous liquors.

CONSTIPATION.

The patient may take:—

Soups.—Meat broths, oyster soup.

Fish.—Boiled fresh fish of all kinds, raw oysters.

Meats.—Almost any fresh, tender meat, poultry, game.

Farinaceous.—Oatmeal, wheaten grits, mush, hominy, whole wheat bread, corn bread, brown bread, rye bread.

Vegetables.—Boiled onions, brussels sprouts, spinach, cauliflower, potatoes, asparagus, green corn, green peas, string beans, salads with oil.

Desserts.—Stewed prunes, figs, baked apples with cream, ripe peaches, pears, oranges, apples, melons, grapes, huckleberries (the blue seedless kind), cherries, raisins, honey, plain puddings, fig puddings, apple charlotte.

Drinks.—Plenty of pure water, cold or hot, black coffee, cocoa, new cider, buttermilk, orange juice, unfermented grape juice.

The patient must *not* take:—

Salt, smoked, potted or preserved fish or meats, pork, liver, eggs, new bread, puddings of rice or sago, pastry, milk, sweets, tea, nuts, cheese, pineapple, spirituous liquors.

DIARRHOEA.

The patient may take:—

Soups.—Milk soup well boiled, clam juice, beef tea.

Meats.—Scraped fresh beef or mutton well broiled, sweetbread, beef juice from freshly broiled steak (all sparingly).

Eggs.—Lightly boiled or poached on dry toast.

Farinaceous.—Rice, sago, macaroni, tapioca, arrowroot, dry toast, milk toast, toasted crackers.

Desserts.—Milk puddings, plain, with sago, rice, tapioca or arrowroot (no sugar).

Drinks.—Tea, toast water, boiled peptonized milk.

The patient must *not* take:—

Oatmeal, wheaten grits, fresh breads, rich soups, vegetables, fried foods, fish, salt meats, lamb, veal, pork, brown or graham bread, fruits, nuts, pies, pastry, ice cream, ice water, sugars, sweets, custards, malt liquors, sweet wines.

LIVER TROUBLES.

The patient may take:—

Soups.—Vegetable soups with a little bread or cracker, light broths.

Fish.—Boiled fresh cod, bass, sole or whiting, raw oysters.

Meats.—Tender lean mutton, lamb, chicken, game (all sparingly).

Farinaceous.—Oatmeal, hominy, tapioca, sago, arrowroot (well cooked), whole wheat bread, dry toast, crackers.

Vegetables.—Mashed potato, almost all fresh vegetables (well boiled), plain salad of lettuce, water cress, dandelions.

Desserts.—Plain milk pudding of tapioca, sago, arrowroot or stewed fresh fruit (all without sugar or cream), raw ripe fruits.

Drinks.—Weak tea or coffee (without sugar or cream), hot water, pure, plain, or aërated water.

The patient must *not* take:—

Strong soups, rich made dishes of any kind, hot bread or biscuits, preserved fish or meats, curries, red meats, eggs, fat, butter, sugar, herrings, eels, salmon, mackerel, sweets, creams, cheese, dried fruits, nuts, pies, pastry, cakes, malt liquors, sweet wines, champagne.

DIABETES.

The patient may take:—

Soups.—Soup or broth of beef, chicken, mutton, veal, oysters, clams, terrapin or turtle (not thickened with any farinaceous substances), beef tea.

Fish.—Shellfish and all kinds of fish, fresh, salted, dried, pickled, or otherwise preserved (no dressing containing flour).

Eggs.—In any way most acceptable.

Meats.—Fat beef, mutton, ham or bacon, poultry, sweetbreads, calf's head, sausage, kidneys, pig's feet, tongue, tripe, game (all cooked free of flour, potatoes, bread or crackers).

Farinaceous.—Gluten porridge, gluten bread, gluten gems, gluten biscuits, gluten wafers, gluten griddle cakes, almond bread or cakes, bran bread or cakes.

Vegetables.—String beans, spinach, beet tops, chicory, lettuce, plain or dressed with oil and vinegar, cucumbers, onions, tomatoes, mushrooms, asparagus, oyster plant, celery, dandelions, cresses, radishes, pickles, olives.

Desserts.—Custards, jellies, creams (without sugar), walnuts, almonds, filberts, Brazil nuts, cocoanuts, pecans.

Drinks.—Tea or coffee (without sugar), pure water, peptonized milk.

The patient must *not* take:—

Liver, sugar, sweets or starches of any kind, wheaten bread or biscuits, corn bread, oatmeal, barley, rice, rye bread, arrowroot, sago, macaroni, tapioca, vermicelli, potatoes, parsnips, beets, turnips, peas, carrots, melons, fruits, puddings, pastry, pies, ices, honey, jams, sweet or sparkling wines, cordials, cider, porter, lager, chestnuts, peanuts.

BRIGHT'S DISEASE.

The patient may take:—

Soups.—Broths with rice or barley, vegetable or fish soup.

Fish.—Boiled or broiled fresh fish, raw oysters, raw clams.

Meats.—Chicken, game, fat bacon, fat ham (sparingly).

Farinaceous.—Hominy, oatmeal, wheaten grits, rice, stale bread, whole wheat bread, toast, milk toast, biscuits, macaroni.

Vegetables.—Cabbage, spinach, celery, water cresses, lettuce, mushrooms, mashed potatoes, cauliflower, onions.

Desserts.—Rice and milk puddings, stewed fruits, raw ripe fruits.

Drinks.—Pure water, peptonized milk, fresh buttermilk, milk with hot water (equal parts), whey, weak tea, toast water.

The patient must *not* take:—

Fried fish, pork, corned beef, veal, heavy bread, hashes, stews, batter cakes, lamb, beef, mutton, gravies, peas, beans, pastry, ice cream, cakes, coffee, tobacco, malt or spirituous liquors.

DEBILITY.

The patient may take:—

Soups.—Any broth thickened with farinaceous material, chicken

or beef soup containing chopped meat, rich vegetable soup, whole beef tea.

Fish.—All fresh fish, boiled or broiled, raw oysters.

Meats.—Beef, mutton, chicken, game, boiled ham, lamb chops or cutlet, broiled bacon, tender, juicy steak, hamburger steak.

Eggs.—Soft boiled, poached, scrambled, raw with sherry wine.

Farinaceous.—Cracked wheat, rolled oats, mush, sago, tapioca, hominy, barley, macaroni, vermicelli, rolls, biscuits, cakes, whole wheat bread, corn bread, milk toast, dry toast, brown bread.

Vegetables.—Nearly all, perfectly fresh and well cooked.

Desserts.—Custards, egg and milk, rice or apple pudding, baked apples, fruit jams, jellies, cocoa junket, marmalade, sweet fruits, calf's foot jelly.

Drinks.—Cocoa, chocolate, milk, hot, cold, or peptonized, pure water, plain or aërated.

The patient must *not* take:—

Hashes, stews, cooked oysters or clams, pork, veal, thin soups, turkey, salt meats (except ham and bacon), cabbage, cucumbers, turnips, carrots, squash, spices, pickles, vinegar, pies, pastry, bananas, pineapples.

OBESITY.

The patient may take:—

Fish.—Nearly all fresh fish, boiled.

Meats.—Lean beef, mutton or lamb, chicken, game (sparingly).

Eggs.—Boiled or poached on toast.

Farinaceous.—Stale bread, dry toast or crusts (sparingly).

Vegetables.—Spinach, lettuce, celery, cresses, asparagus, cauliflower, onions, white cabbage, tomatoes, radishes, olives.

Desserts.—Ripe fruits only—acid varieties preferable.

Drinks.—One cup of tea or coffee, without milk, cream, or sugar, or one glass of pure water, sipped at the end of the meal.

The patient must *not* take:—

Soups, salmon, bluefish, eels, salt fish, pork, veal, sausage, made dishes, fats, potatoes, macaroni, oatmeal, hominy, spices, rice, beets, carrots, turnips, parsnips, puddings, pie, pastry, cake, sugars, sweets, milk, cream, malt or spirituous liquors, beers, sweet wines, champagne.

RHEUMATISM.

The patient may take:—

Soups.—Mutton broth, chicken or beef tea, in small quantities.

Fish.—Raw clams or oysters, fresh fish (whiter kinds), boiled.

Meats.—Chicken, calf's head, sweetbread, tripe, broiled fat bacon or boiled ham (all sparingly).

Farinaceous.—Whole wheat, corn or brown bread, arrowroot, rice, dry toast, milk toast.

Vegetables.—Spinach, green peas or cabbage (well boiled), celery, lettuce, cresses, radishes.

Desserts.—Milk, rice or arrowroot pudding (all without sugar), junket.

Drinks.—Tea (without sugar), buttermilk, pure water, plain, with lemon or lime juice (no sugar).

The patient must *not* take:—

Pork, veal, turkey, goose, duck, fried fish or meats, cooked oysters or clams, salted, dried, potted, or preserved fish or meats (except fat bacon or ham), crabs, salmon, lobster, eggs, rich made dishes, gravies, potatoes, tomatoes, beans, asparagus, mushrooms, candies, rich puddings, pies, pastry, nuts, cheese, coffee, cider, malt liquors, wines.

GOUT.

The patient may take:—

Soups.—Fresh fish soups, vegetable broths, clear.

Fish.—Raw oysters, fresh fish, boiled.

Meats.—Fat bacon, boiled or broiled chicken, game (all sparingly).

Farinaceous.—Cracked wheat, oatmeal, rice, sago, hominy, whole wheat bread or biscuits, rye bread, graham bread or rolls, crackers, dry toast, milk toast, macaroni.

Vegetables.—Mashed potato, green peas, string beans, spinach, cabbage, cucumbers, cresses, lettuce, celery.

Desserts.—Plain milk pudding, junket, rice and milk, stewed fruits (all without sugar).

Drinks.—Weak tea (no sugar), milk, buttermilk, toast water, pure water, cold or hot.

The patient must *not* take:—

Veal, pork, goose, duck, turkey, salted, dried, potted, or preserved fish or meat (except fat bacon), eels, mackerel, crabs, salmon, lobster, eggs, rich soups, gravies, patties, tomatoes, sweet potatoes, asparagus, mushrooms, rhubarb, lemons, pickles, vinegar, fried or made dishes,

rich puddings, spices, pies, pastry, sweets, cheese, nuts, dried fruits, tobacco, coffee, cider, malt liquors, sweet wines, champagne.

PHTHISIS (CONSUMPTION).

The patient may take:—

Soups.—Turtle or oyster soup, mutton, clam, or chicken broth, puree of barley, rice, peas, beans, cream of celery or tomatoes, whole beef tea, peptonized milk gruel.

Fish.—All kinds of fresh fish, boiled or broiled, oysters or clams, raw, roasted, or broiled.

Meats.—Rare roast beef or mutton, lamb chops, ham, fat bacon, sweetbreads, poultry, game, tender steaks, hamburger steak, rare.

Eggs.—Every way except fried.

Farinaceous.—Oatmeal, wheaten grits, mush, hominy, rice, whole wheat bread, corn bread, milk toast, biscuits, muffins, gems.

Vegetables.—Potatoes, baked, boiled, or creamed, string beans, spinach, onions, asparagus, tomatoes, green peas (all well cooked), lettuce, cresses, celery.

Desserts.—Farina, sago, tapioca, apple or milk pudding, floating island, custards, baked or stewed apples with fresh cream, cooked fruits, rice with fresh cream.

Drinks.—Fresh milk, cool, warm, or peptonized, cocoa, chocolate, buttermilk, pure water, tea, coffee.

The patient must *not* take:—

Fried foods, salt fish, hashes, gravies, veal, pork, carrots, parsnips, cabbage, beets, turnips, cucumbers, macaroni, spaghetti, sweets, pies, pastry, sweet wines.

DISHES FOR THE SICK.

PEPTONIZED FOODS.

For peptonizing milk and other foods either the tubes or essence of pepsin or tablets may be used. Junket tablets are convenient for use. These preparations are to be procured from any drug store, as they are in constant demand.

Immediate Process.

Put two tablespoonfuls (1 ounce) of cold water in a goblet or glass; dissolve in this one quarter the contents of a peptonizing tube;

add eight tablespoonfuls (4 ounces) of warm milk; drink immediately, sipping slowly.

If half a pint of milk is desired, double the proportions of water, peptonizing powder, and milk.

By the Cold Process.

Into a clean, quart bottle put the powder contained in one of the Fairchild peptonizing tubes and a teacupful (gill) of cold water; shake, then add a pint of fresh, cold milk, shake the mixture again and immediately place the bottle on ice, without subjecting it to the water-bath or any heat. Place the bottle directly in contact with the ice.

When needed, shake the bottle, pour out the required portion, and use in the same manner as ordinary milk.

Partially Peptonized Milk.

Put into a clean agate ware or porcelain-lined saucepan the powder contained in one of the peptonizing tubes, and a teacupful (gill) of cold water; stir well; then add a pint of cold, fresh milk. Heat with constant stirring until the mixture boils. The heat should be so applied that the milk will come to a boil in ten minutes. When cool, strain into a clean bottle, cork well, and keep in a cold place. When needed, shake the bottle, shake out the required portion, and serve cold or hot, as directed by the physician in charge.

N. B.—Milk so prepared will *not* become bitter.

Peptonized Milk.

Into a clean, quart bottle put the powder contained in one of the peptonizing tubes, and a teacupful (gill) of cold water; shake, then add a pint of fresh, cold milk, and shake the mixture again. Place the bottle in water so hot that the whole hand can be held in it without discomfort (about 115° F.).

Keep the bottle there five or ten minutes as directed.

At the end of that time put the bottle on ice *at once* to check further digestion and keep the milk from spoiling.

Place the bottle directly in contact with the ice.

The degree of digestion is very simply regulated by the length of *time* in which the milk is kept warm.

Peptonized Milk Gruel.

Thick, well boiled, hot gruel, one-half pint.

Milk, fresh, cold, one-half pint.

Mix and *strain* into a small pitcher or jar, and immediately add the contents of one peptonizing tube; mix well. Let it stand in the hot water bath, or warm place, for five minutes, then put in a clean bottle and place on ice. Serve hot or cold.

Gruel made from arrowroot, flour, barley, oatmeal, etc., will serve for the purpose. In each instance the farinaceous material should be boiled with water until the starch granules have been thoroughly swollen, broken up, and incorporated with the water.

To Make Junket and Whey, Using Essence of Pepsin.

Junket.—Into a clean saucepan put one-half pint of fresh, cool milk, heat it lukewarm (not over 100° F.); then add one teaspoonful of essence of pepsin, and stir just enough to mix; divide quickly into small cups or glasses and let stand until firmly jellied, when the junket is ready for use, just as it is, or with sugar; it may be placed on ice and taken cold.

Whey.—Into a clean saucepan put one pint of fresh, cool milk, heat it lukewarm (not over 100° F.); then add two teaspoonfuls of essence of pepsin, and stir just enough to mix; let it stand until firmly jellied, then beat with a fork until it is finely divided; now strain and the whey (liquid part) is ready for use; keep in a bottle near ice.

Whey is a highly nutritious fluid food, containing in solution the sugar and the salts (the mineral constituents) of the milk, and holding also in suspension a considerable portion of caseine and fat (cream), which pass through the strainer. It is peculiarly useful in many ailments, and always valuable as a means of variety in diet for the sick. It is frequently resorted to as a food for infants to tide over periods of indigestion, summer complaints, etc.

General Directions for Making Junket with Junket Tablets.—Junket tablets contain nothing but pure rennet ferment and a little pure table salt; they contain no chemicals, cornstarch, or gelatine. The results they produce in milk may seem marvelous, yet you will remember that from pure milk and cream such palatable and solid foods as butter and cheese are made. If you will follow a few plain, easy directions, you can, with the aid of junket tablets, combine all the nourishing, healthful properties of butter and cheese contained in pure milk into a milk jelly, exquisitely delicious, smooth, and velvety. You cannot use milk or cream that has been scalded or overheated and then cooled, or milk

treated with preservatives, or watered, evaporated, condensed, pasteurized, or sterilized milk.

Milk must be just warm—that means lukewarm, blood warm, or 98° F. Temper it just so that it does not taste hot or cold, or feel hot or cold to the finger. While the milk is warming, which may be done over the fire in a pan of hot water, stir in the sugar and add flavors or colors to suit the taste. When the milk is just lukewarm remove it at once from the fire, or it will overheat.

Have the junket tablet dissolved, ready for use, in a tablespoonful of cold water. Do not dissolve it in warm or hot water or in milk.

Eight junket or sherbet glasses hold one quart of junket. Have them all ready in a warm room where they will not be disturbed. In cold weather warm the dish before using.

Stir the dissolved junket tablet quickly into the warmed, sweetened, and flavored milk (one quick stir of the spoon is enough), then pour at once into the cups, filling them two-thirds full. If you prefer, pour the whole quart into one large dish, but in serving from the large dish the junket is broken, whey forms quickly, and the dainty appearance of the dessert is destroyed. Therefore individual dishes are preferable.

Every housekeeper knows that in baking cake or custard it must not be shaken or roughly handled, or it will fall. Be just as careful with junket while it is jellying, or it will break loose from the dish and become watery. Therefore do not move, jar, or disturb it for ten minutes. When firm remove carefully to a cool place or the ice chest until ready to serve.

Devonshire Junket.

Stand rich, twelve-hours-old milk where it will come very slowly to scald, and let it remain at that temperature ten or fifteen minutes; then set away to get cold.

Make a plain junket, and when ready to serve lift the cream from the scalded milk, place it on top of the junket and serve; or it may be served in the good old English style with clotted cream and port wine.

Coffee Junket.

Make a half-cup of strong coffee by pouring a half-cup of freshly boiling water over two tablespoonfuls of pulverized coffee. Heat one and three-quarters pints of milk until lukewarm, add the coffee and a half-

cup of sugar. Stir until dissolved. Add the dissolved tablet and finish as in plain junket. Serve with whipped cream heaped on top.

Whey.

The junket tablet may be used conveniently in the preparation of whey, a refreshing and slightly stimulating beverage, very useful in the sick room, especially in febrile conditions.

As in the coagulation of milk the curd takes with it the caseine and most of the fat, the whey contains only the milk-sugar and salts dissolved in the water, with a very small portion of nitrogenous substance. It may be considered mildly nutritive and very wholesome; if fresh, it is readily assimilated by the stomach, requiring no labor to fit it for absorption, and contains in a degree every element of nutrition. Whey is strongly recommended as a most satisfactory food in cholera infantum, and is far more suitable than any other food preparation as a temporary substitute for milk. For adult invalids whey is a most pleasing and nutritious drink.

To Prepare Whey.

Have the required quantity of milk just lukewarm to 100° F. and add the dissolved tablet—one to each quart of milk. Allow it to jelly in a warm place. Then break up the curd and strain through two thicknesses of cheese cloth, being careful to remove *all* the caseine. Whey should be used cold, with or without sweetening, and flavored with any desired flavoring.

Junket from Cream.

This may be made the same as that made with milk, using cream in the place of milk and in the same proportions. When ready to use turn out on to a dish and heap round the base some tart jelly, and serve at once.

Custard Junket.

Put over the fire to scald a half-pint of milk. Beat together two eggs and a quarter cup of sugar until light, stir into the scalding milk, and stir constantly until it thickens; take at once from the fire. Have a pint and a half of milk in which is dissolved another quarter cup of sugar, add the cooled custard slowly, and mix evenly. When lukewarm add a teaspoonful of vanilla and the dissolved tablet, and finish as the plain junket.

Junket with Raw Egg.

Separate two eggs, beat the whites until perfectly dry; beat the yolks until thick. Add them to the whites gradually, beating constantly. Heat one pint of milk until lukewarm, dissolve in it two tablespoonfuls of sugar, add a half teaspoonful of flavoring. Pour this over the beaten eggs, stir in a half junket tablet dissolved in a dessert-spoonful of cold water and turn quickly into glasses. Stand in warm place for half an hour until firm, then put in cold place.

Wine Junket.

Dissolve two tablespoonfuls of sugar (granulated) in three tablespoonfuls of wine or brandy; add one teaspoonful of lemon juice and a little grated nutmeg. Heat one pint of fresh milk, *just warm,* as for plain junket. Take it from the fire; stir in the wine, then the dissolved tablet (one-half a tablet to the pint), and proceed as for plain junket. If required, as a medium for administering wine, brandy, or whisky in sickness, as much as four tablespoonfuls may be used.

Junket Eggnog.

Beat the yolks of two eggs and a teaspoonful of sugar to a light cream, whip the white of the eggs to a stiff froth, mix them together gradually, beating constantly. Dissolve four tablespoonfuls of sugar in three tablespoonfuls of Jamaica rum and mix with the beaten egg. Have one quart of milk or cream just lukewarm, stir in the mixture of egg, sugar, and rum, then stir in quickly one junket tablet, already dissolved in one tablespoonful of cold water, and pour immediately into warm junket glasses, sprinkle grated nutmeg over the top of each. Stand in warm room a half hour. When firm, put in a cool place. This is very nourishing and strengthening for invalids, and can readily be retained by the most delicate stomach. Any other liquor may be used in place of the rum.

Whipped Cream.

Take half a cup of heavy cream, add one cup of rich milk, two tablespoonfuls of powdered sugar, and two tablespoonfuls of wine or brandy, or half a tablespoonful of other flavoring. Serve the junket with the whip above it.

Champagne Junket.

Dissolve one-fourth cup of granulated sugar in three tablespoonfuls of champagne; add one teaspoonful of Chr. Hansen's lemon flavor.

Dissolve half a junket tablet in a dessert-spoonful of cold water. Heat one pint of milk lukewarm. Take from the fire; stir in the wine, then the dissolved half tablet, and pour into champagne glasses.

Koumyss.

This is a preparation of milk which is very useful for children and adults during convalescence from acute or subacute, or exhausting diseases. Even young children of three or four years will take a fancy to it if it is not made too sour by continuing the fermentation process too long. The liquid is prepared as follows: Add to one pint clear, perfectly fresh milk two teaspoonfuls of sugar and place it, after shaking thoroughly in a clean beer or claret bottle. Then add one-sixth cake Fleischmann's yeast and tightly cork the bottle, standing it in a warm place, or a water bath at 99° to 100° F. for from eight to ten hours. Then place in a cool place or on the ice and use as needed. It must be remembered that the development of carbonic acid gas is very great in this liquid, and if an ordinary cork is inserted it must be tied in before heat is applied. Further than this, the cork must be pulled very gently or the liquid will spurt all over the room. The best thing to use to open a bottle of koumyss is a "champagne tap," by means of which the liquid may be drawn off as needed.—*Dr. Hare, in Practical Therapeutics.*

SOUPS.

Beef Tea.

Cut up a pound of rump steak into small pieces, and put it into a bottle (wide-mouthed fruit jar), putting a very small quantity of lukewarm water into the bottle with it, cork tightly and put the bottle into a kettle of warm water; the water should be allowed to boil for a considerable time; the bottle should then be removed and the juice drained off. The tea may be salted a little, and a teaspoonful given at a time.

Another Beef Tea.

The latest and most approved method of making beef tea, is to take a half pound of good steak, broil slightly over hot coals; then lay in a shallow dish, and, with a sharp knife, gash it on both sides until it is cut into mere shreds; then pour half a pint of boiling water over it, and scrape hard for a few moments, when all the nutriment of the beef will be extracted. This is the easiest, quickest, and, by many, thought to be the best method.

Chicken Tea.

Take off the skin and all the fat of the fowl, and boil it till very tender, with just enough water to cover it, and add a little salt. Take the chicken out of the liquor when boiled, and let the liquor remain until cold to let all the fat rise to the surface, which should then be skimmed off. The tea should be heated when given to the patient. It is a very delicate, nourishing food, and will set well on the stomach when so weak as to be able to retain but little food.

Chicken Broth.

Take half a chicken, remove all the fat, cut the meat in small pieces and break the bones; put into a vessel with three pints of boiling water; boil for an hour, season with salt and strain.

Lamb Broth.

Stew a lamb chop in a quart of water until it comes to shreds, add a teaspoonful of barley or rice, and a little salt and onion, if desired. Strain, and add a little parsley.

Oyster Soup.

Take of oysters, a half dozen; milk, a teacupful, with enough liquor of the oysters to make a bowl; a few allspice and cloves, a nice lump of butter, pepper, and salt. Bring to a boil and skim. Then throw in the oysters and simmer. Add a few toasted crackers before removing from the fire.

Mutton Tea.

Take one pound of mutton, remove the fat and cut the meat in small pieces; pour half a pint of boiling water over it, and let it stand near a fire for half an hour, and then boil for one hour, strain through a sieve or cloth, add salt to suit the taste. A very nourishing diet.

Vegetable Soup.

Take two Irish potatoes, one onion, and a piece of bread; place them in a quart of water; add a little celery or parsley toward the close of the boiling. Salt and pepper may be employed at pleasure.

Peptonized Beef.

Take one pound minced lean beef, cold water one-half pint; mix in a saucepan. Cook over a gentle fire, stirring constantly until it has boiled a few minutes. Then pour off the liquor for future use;

beat the meat to a paste, put it into a clean fruit jar with one-half pint of cold water and the liquor poured over the meat and add:—

Extract of Pancreas,.....20 grains.
Sodium Bicarbonate (Baking Soda),.....15 grains.

Shake well together; set aside in a warm place, at about 110° or 115° F. for three hours, stirring or shaking occasionally; then boil quickly. The liquid may be strained or clarified by the white of an egg in the usual manner; season to taste, with salt and pepper. In the great majority of cases it is not necessary to strain the peptonized liquor, for the portion of meat remaining undissolved will have been so softened and acted upon by the pancreatic extract that it will be in very fine particles, and diffused in an almost impalpable condition, and is therefore ready for assimilation in the body.—*Dr. Hare, in Practical Therapeutics.*

Peptonized Oysters.

Peptonized oysters are prepared by mincing six or twelve large oysters and adding to them, when mixed with a moderate amount of their liquid, five grains of pancreatin, or peptonizing powder, and twenty grains of sodium bicarbonate. The cup containing this mixture is now placed in warm water at 100° F. and allowed to remain there from ten to twenty minutes, according to the degree of digestion desired. After this the liquid mass is quickly brought to a boil to cook the oysters and stop digestion, and is served with pepper and salt as required. Any condiment or flavoring substance may be used.—*Dr. Hare, in Practical Therapeutics.*

FARINACEOUS FOODS.

Panada.

Break into a bowl three good-sized crackers (arrowroot or oatmeal are nice) broken into small pieces; pour upon them boiling water and cover close for a minute, then add a tablespoonful of white sugar and a little pure milk. It is an excellent breakfast or supper for a child or an invalid. Instead of the milk the juice of a lemon may be squeezed in and another teaspoonful of sugar added, if there is fever.

Indian or Oat Meal Gruel.

This simple refreshment is invaluable in sickness, and is made with little trouble and less expense, yet it is very seldom prepared exactly right.

One tablespoonful of fine Indian or oat meal, mixed smooth with cold

water and a little salt; pour upon this a pint of boiling water, and turn into a saucepan to boil gently for half an hour; thin it with boiling water if it thickens too much, and stir frequently; when it is done a tablespoonful of cream or a little new milk may be put in to cool it after straining, but if the patient's stomach is weak it is best without either. Some persons like it sweetened and a little nutmeg added, but to many it is more palatable plain.

Arrowroot Gruel.

Add a teaspoonful of arrowroot to half a pint of boiling water; mix well, add half a pint of milk and boil together for two or three minutes; sweeten to the taste. A little lemon juice or wine may be added.

Water Gruel.

Corn or oat meal, two tablespoonfuls; water, one quart. Boil for ten or fifteen minutes, and add sugar or salt, if desired by the patient.

Ground Rice Gruel.

Ground rice, one heaping tablespoonful; ground cinnamon, half a teaspoonful; water, one quart. Boil slowly for fifteen or twenty minutes, add the cinnamon when it is nearly done boiling, strain and sweeten.

Sago Gruel.

Sago, two tablespoonfuls; water, one pint. Boil until it thickens, frequently stirring. Wine, sugar, and nutmeg may be used if desirable.

Thickened Milk.

With a little milk, mix smooth a tablespoonful of flour and a pinch of salt. Pour upon it a quart of boiling milk, and when it is thoroughly mixed, put all back into the saucepan and boil up at once, being careful not to burn, and stirring all the time, to keep it perfectly smooth and free from lumps. Serve with slices of dry toast. It is excellent for diarrhœa; this alone will often cure it by scorching the flour before mixing with the milk.

Wheat Balls.

Tie half a pound of wheat flour in thick cotton and boil it three or four hours; then dry the lump, and grate it when you use it. Prepare a gruel of it by making a thin paste, and pouring into boiling milk and water, and flavor with salt. This is good for teething children.

Suet Boiled in Rice.

Take some *rice milk* (boiled rice and milk), and boil it. When nearly boiled enough, add a dessert-spoonful of beef suet, already minced as small as bread crumbs. Boil slowly for a few minutes, and take off the scum as it rises. Or the suet may be inclosed in a muslin bag. It must be eaten hot.

Oatmeal.

Take half a teacup of oatmeal, add one pint of cold water; put into a tin dish in a kettle of water and boil slowly for two hours, adding more hot water if necessary. Another excellent way to cook oatmeal is to steam it.

Oatmeal Jelly.

One cup oatmeal, one and one-half pints water, and a little salt. Bake in the oven until it thickens to a starchy substance. Serve warm, with sugar and cream.

Tapioca Jelly.

One-half cup tapioca, two cups water, one-half cup sugar, juice and rind of one lemon. Cook the tapioca in the water one hour, using a double boiler. At the end of that time add lemon and sugar and three teaspoonfuls of brandy. Strain and serve cold with milk. This is one of the few things for the sick of which enough can be prepared for several meals.

Parched Rice.

Cook in a custard kettle one-half cup parched rice in one pint salted boiling water. Serve with cream and sugar.

Mush.

The water must be fresh, salted, and boiling when the corn meal is sprinkled in, so that the starch cells may burst. It is best to use a porcelain lined or agate kettle. Stir constantly with one hand and sprinkle the meal with the other. Take any amount of water and sprinkle in meal until the mixture is quite thick, when a few sprinklings of flour will seem to make it more palatable. Cover closely and let stand on back of stove for an hour or two, or even half a day. Do not stir after removing from the fire, as this permits the flavor to escape with the steam.

Dry Toast.

Cut your slices of bread even and not too thick. Toast before a clear

fire, a nice light brown. Cover with a napkin and serve quickly, while it is hot. Dry toast is not always good for invalids, especially when the bowels are confined and it is desirable to keep them open. In this case graham bread, not toasted, is much better.

Milk Toast.

This is a favorite dish with nearly all sick people, when they are getting well. Cut stale bread in rather thin slices, toast a fine brown, and lay them in a deep dish. Meanwhile boil a quart of new milk in a lined saucepan, in which you have first put a very little cold water, to prevent burning. As soon as it boils pour it over the toast, cover and serve quickly. For an invalid no butter should be put in the milk. Some people put in a thickening of flour, but this spoils it for many.

"Soft" Toast.

Some invalids like this very much indeed, and nearly all do when it is nicely made.

Toast well, but not too brown, a couple of thin slices of bread, put them on a warm plate and pour over boiling water; cover quickly with another plate of the same size and drain the water off; remove the upper plate, butter the toast, put in the oven one minute and then cover again with a hot plate and serve at once.

Watered Toast.

Toast several pieces of bread and carefully butter, so that the butter is equally distributed. Salt and pepper to taste, and finally pour as much boiling water on the edges of the crust as is necessary to thoroughly soften, and serve to the patient.

This is a much more agreeable dish than might be imagined, and is useful when milk toast is distasteful.

Almond Bread for Diabetics.

Take of blanched sweet almonds one-quarter pound; beat them as fine as possible in a stone mortar; remove the sugar contained in this meal by putting it into a linen bag and steeping it for a quarter of an hour in boiling water, acidulated with vinegar; mix this paste thoroughly with three ounces of butter and two eggs. Next add the yolks of three eggs and a little salt, and stir well for some time. Whip up the whites of

three eggs and stir in. Put the dough thus obtained into greased molds and dry by a slow fire.—*Dr. Hare, in Practical Therapeutics.*

Bran Bread for Diabetics.

Take a sufficient quantity (say one quart) of wheat bran; boil it in two successive waters for one-quarter hour each time, straining it through a sieve. Then wash it in cold water (on the sieve) until the water runs off perfectly clear. Squeeze the bran in a cloth as dry as possible, then spread it thinly on a dish and place it in a slow oven. If put in at night, let it remain until morning, when, if perfectly dry and crisp, it will be fit for grinding.

The bran thus prepared must be ground in a fine mill and sifted through a wire sieve of such fineness as to require the use of a brush to pass it through; that which remains in the sieve must be ground again until it becomes quite fine.

Take of this bran powder three ounces (some patients use four ounces) and other ingredients as follows: Three newly laid eggs, one and one-half ounces (or two ounces if desired) butter, and about one-half pint milk; mix the eggs with a little of the milk and warm the butter with the other portion; then stir the whole well together, adding a little nutmeg or ginger, or any other agreeable spice. Bake in several patty tins, which must be well buttered, in a rather quick oven for about one-half hour. The cakes, when baked, should be a little thicker than a ship's biscuit; they may be eaten with meat or cheese at breakfast, dinner, and supper; at tea they require rather a free allowance of butter, or they may be eaten with curd or other soft cheese. It is important that the above directions as to washing and drying the bran should be exactly followed, in order that it may be freed from starch and rendered friable. The bran in its common state is soft, and not easily reduced to a fine powder. In some seasons of the year, or if the cake has not been well prepared, it changes more rapidly than is convenient, owing to moisture. This may be prevented by placing the cake before the fire for five or ten minutes every day.—*Dr. Hare, in Practical Therapeutics.*

EGGS.

Eggnog.

Beat an egg until it foams, put it into a glass and fill the glass with cool, rich milk; add from a teaspoonful to a tablespoonful of brandy, and sweeten to taste.

Milk and Eggs.

Beat up a fresh egg with a grain of salt, pour upon it a pint of boiling milk, stirring all the time. Serve hot, with or without toast. It is good in case of weakness, for an early breakfast, or for a traveler before starting on a journey.

Soft Boiled Eggs.

Fresh eggs for invalids who like them cooked soft should be put in a pan of boiling water, and set on a part of the stove where they will not boil, for several minutes. At the end of that time they will be like jelly, perfectly soft, but beautifully done and quite digestible by even weak stomachs.

Soft Custard.

Milk, a pint. Place it to boil; while boiling, take of eggs, three; separate them, and beat up the yolks with sugar enough to sweeten to the taste, and with cornstarch, a teaspoonful, rubbed in smoothly. Then pour this egg and cornstarch mixture into the pint of boiling milk; boil for a few minutes, and stir constantly to prevent lumping and burning. When the whole becomes a thick, creamy mass, remove. Have ready, in a dish, some stale sponge cake, slightly wet with brandy or wine. Pour the custard over it, and cover all with the white of the three eggs whipped stiff, with a half teacupful of pulverized sugar, and flavored with vanilla.

Egg Toast.

Make a soft toast and have ready one or more fresh eggs, which have been boiled *twenty* minutes; remove the shells, cut them in slices and place upon the toast, with a little butter, pepper, and salt; without the butter they may be eaten with impunity by the most delicate invalid, as an egg cooked for twenty minutes is really more easy of digestion than one that is termed "soft boiled."

Poached Eggs.

Into boiling milk which has been seasoned with butter and salt drop fresh eggs, cover, and let simmer for three minutes, when they may be removed to a piece of buttered toast. The toast may or may not have been softened with the hot milk, as desired.

DESSERTS.

Tapioca Cup Pudding.

This is very light and delicate for invalids. An even tablespoonful of tapioca, soaked for two hours in nearly a cup of new milk. Stir into this the yolk of a fresh egg, a little sugar, a grain of salt, and bake in a cup for fifteen minutes. A little jelly may be eaten with it, or a few fresh strawberries.

Invalid Cup Pudding.

One tablespoonful of flour, one egg; mix with cold milk and a pinch of salt, to a batter. Boil fifteen minutes in a buttered cup. Eat with sauce, fruits, or plain sugar.

Invalid Apple Pie.

Slice up one or more nice, tart apples in a saucer, sweeten with white sugar and cover with a moderately thick slice of bread, buttered slightly on the underside. When the bread is nicely browned, the apples, if of a tender kind and thinly sliced, will be done.

Roast Apples.

These can nearly always be eaten with safety, when they are eaten with relish. Choose good sized, fair apples of a tart and juicy, but not of a sour, kind. Rub them off clean, and put them in rather a slow oven, which may increase in warmth, so that they shall be thoroughly done in an hour. When so soft that the savory pulp breaks through the browned skin in every direction, take them out, sift white sugar over them, and carry one at a time on a saucer to the patient.

Stewed Prunes.

These are extremely good in smallpox, measles, scarlet fever, and the like, both as food and medicine. Get the box prunes, as they will not need washing, and because they are generally of a much better quality than the open sort. Soak them for an hour in cold water, then put them in a porcelain lined saucepan, with a little more water if necessary, and a little water and crushed sugar. Cover and let them stew slowly an hour, or until they are swollen large and quite soft. They are excellent as an accompaniment to breakfast for a sick woman.

Orange Gelatine.

Soak one teaspoonful granulated gelatine in one tablespoonful cold water one-half hour, add one tablespoonful boiling water and dissolve. Add two tablespoonfuls sugar, three tablespoonfuls orange juice, and two teaspoonfuls lemon juice; strain through cloth and strainer into cold, wet molds, and set away to harden. Cut orange in half, crosswise; remove pulp and strain. Fill with the jelly, and when firm cut into thirds, leaving the rim filled with the jelly. Place on a plate and serve with whipped cream in the center. (Individual recipe.)

Orange Charlotte.

Soak two teaspoonfuls gelatine in one tablespoonful cold water one-half hour; add one-third cup boiling water and dissolve. Add one-third cup sugar, three tablespoonfuls orange juice, and one tablespoonful lemon juice, and set on ice to cool, stirring frequently. When hardened, fold in the stiffly-beaten whites of two eggs; mix thoroughly and pour into cold, wet molds, and set away to harden. Remove by dipping mold in warm water. Serve with soft custard. (Individual recipe.)

Snow Pudding.

Soak two teaspoonfuls granulated gelatine in three tablespoonfuls cold water, and add one-third cup boiling water and dissolve. Add three tablespoonfuls sugar and one and a half tablespoonfuls lemon juice. When sugar is dissolved, set on ice to cool, stirring occasionally. When jelly is firm, fold in the stiffly-beaten white of one egg and pour into cold, wet molds, and place on ice to cool. When solidified, remove and serve with soft custard. (Individual recipe.)

Strawberry Mousse.

Soften one-quarter box shredded gelatine, or one tablespoonful granulated gelatine in one-quarter cup cold water; add one-quarter cup boiling water and dissolve. Whip one pint cream until stiff, and add one-half cup powdered sugar. Add one cup strawberry juice to the gelatine, fold the cream in carefully, turn into a wet mold, and pack in salt and ice for two hours. Before serving, turn out of mold on to a glass dish and garnish with fresh strawberries and whipped cream.

BOOK IV.

LOCAL DISEASES OF ADULTS.

JOHN H. McCORMICK, Editor-in-Chief.

DISEASES OF THE HEAD.

DANDRUFF OR SEBORRHOEA.

A diseased condition of the sebaceous glands of the skin. When it affects the head it is commonly known as Dandruff and it takes the form of very small flakes or scales or crusts. It appears on the forehead and nose in the form of an oily coating. Scales or flakes also appear in any part of the body. These latter forms are known as Seborrhœa.

Causes.—While there is no doubt that anæmia (deficiency of blood) contributes to the condition, the cause of the disease is not well understood. Women are more subject to it than men; and brunettes than blondes. It is this same condition of the sebaceous glands that causes the body of a newborn infant to be covered with a sebaceous secretion producing the condition known as *vernix caseosa.*

Symptoms.—The well-known dry, more or less greasy, gray, brown, or yellow flakes or crusts adhere to the scalp and sometimes itch annoyingly. It appears on the face in the form of a greasy, oily coating on the forehead or nose. It cannot be mistaken for eczema, because dandruff scales are always dry, while eczema at some stage is moist with a watery secretion; dandruff scales are pale in color and very abundant; eczema scales are few in number and are very red in color.

Prognosis.—While it is an obstinate disease, it will yield to persistent treatment. Its termination is usually favorable, but the danger of baldness caused by it must not be overlooked.

Treatment.—As the healthy condition of the sebaceous glands of the skin depends upon the general health, a radical cure requires that a course of tonics be given. For this purpose use:—

Fowler's Solution of Arsenic,.....1 dram.
Bitter Wine of Iron,.....4 ounces.

One teaspoonful of this solution in a wineglass of water after each meal.

Or:—

Wine of Iron,.....1½ ounces.
Simple Syrup,.....2 drams.
Solution of Potassium Arsenite,.....2 drams.
Water,.....2 ounces.

Take a teaspoonful after each meal in a wine glass of water.

For local treatment, which is of the utmost importance, the following will prove efficacious:—

The scalp should be thoroughly anointed with olive oil to soften the crusts and then washed with warm water and tincture of green soap every second day for a week, and afterward washed with tincture of green soap once a week until the condition disappears. Apply daily as a hair dressing:—

Oil of Bergamot,.....2 drops.
Ointment of Red Oxide of Mercury,.....4 drams.
Benzoinated Lard,.....1½ ounces.

Or:—

Precipitated Sulphur,.....1 dram.
Salicylic Acid,.....10 grains.
Vaseline,.....1 ounce.

Apply directly to the hair, rubbing well into the scalp every night.

Or:—

Boroglycerin,.....2 drams.
Rose Water,.....8 ounces.

Apply every night, rubbing well into the scalp.

Or:—

Tincture of Cantharides,.....3 drams.
Tincture of Capsicum,.....3 drams.
Oil of Lemon,.....1 dram.
Castor Oil,.....2 drams.
Alcohol,.....2 ounces.
Spirits of Rosemary,.....1 ounce.

Apply every night and morning, rubbing well into the scalp.

BALDNESS OR ALOPECIA.

The partial or complete loss of hair.

Causes.—The disease may be inherited or acquired. If acquired, it occurs both in age and in early life. It may be a symptom of such other diseases as: syphilis, fevers, dandruff, itch, eczema, and parasitic skin diseases.

Prognosis.—The seriousness of the disease depends entirely upon the cause. When it proceeds from old age, the hair can never be restored. If from other causes which can be speedily and completely removed the probability of the return of the hair is considerable.

Treatment.—This is to be adapted to the probable cause.

If due to dandruff, the treatment of that condition should be followed.

If due to anæmia (bloodlessness), general tonic treatment must be instituted. (See "Anæmia," page 439.)

If due to syphilis, the treatment will be the treatment of that disease, and in all such cases a physician should be consulted.

In all forms of baldness the following will be found of benefit:—

Gallic Acid,.....1 dram.
Cologne Water,.....2 drams.
Tincture of Cantharides,.....1 dram.
Vaseline,.....2 ounces.

Mix and rub well into the scalp once daily.

Or, the following may be used:—

Mix well together—

Liquor of Ammonia,.....1 ounce.
Camphorated Alcohol,.....1½ drams.
Bay Salt,.....½ ounce.
Water,.....1 pint.

With this mixture bathe the head three times a day. Afterwards, rub well into the scalp a pomatum made of fresh lard, four parts, and camphor, one part. The action of the sedative water restores the capillary circulation which forms the bulb of the hair, and imparts new life to the organ. The pomatum assists and favors the growth.

Or, use either of the following:—

Castor Oil,.....1½ ounces.
Tincture of Cantharides,.....½ ounce.

Mix well together, and rub the bald part with it night and morning.

Or, lard, made to a thin consistence with bay rum, rubbed in night and morning.

One of the most successful remedies ever used is prepared as follows:—

Glycerine,.....4 ounces.
Tannin,.....1 dram.
Tincture of Cantharides,.....2 drams.
Oil of Capsicum,.....10 drops.

Apply to the bald spots morning and evening.

PARTIAL BALDNESS OR ALOPECIA AREATA.

Patches or small areas of baldness on the scalp and beard.

Causes.—In some cases this seems to be caused by a parasite; in others, by a disturbance of the nervous system.

Symptoms.—The scalp, beard, and eyebrows are affected by one or more round, smooth, white patches or spots of baldness. These differ from the spots in ringworm by the absence of broken off hairs or of any signs of the follicles. There may be at first some redness of inflammation, but the spots very soon turn white. They may appear gradually or suddenly.

Prognosis.—Recovery is very slow; faster in children than in adults. The older the person the more doubtful the recovery. When the hair does begin to return it appears as a fine, white down; after which the stronger natural hair follows.

Treatment.—The tonic preparations recommended for baldness are very satisfactory; as are also the local applications.

The following tonic taken internally proves valuable in some cases:—

Fluid Extract of Jaborandi,.....1 ounce.

Take 10 drops in water three times a day.

For local applications follow the treatment for baldness as there given.

NEURALGIC HEADACHE OR TIC DOULOUREUX.

Sudden pain of a sharp and darting character.

Causes.—Anæmia; cold; eye-strain; affections of the teeth; anxiety; mental exertion; rheumatism; syphilis; such tendency as occurs in families almost proves that it is heredity.

Symptoms.—Sharp, lightning-like, shooting, stabbing pains, most common at points just above and below the eye; sometimes twitching of the muscles and pain along the course of the nerve. It is often most severe along the left side of the head and face, and is accompanied by a profuse flow of tears.

Treatment.—Attention to the general health must be given during the intervals of the attack. Nutritious diet and treatment of the cause as directed in anæmia, rheumatism, malaria, etc., which see.

MIGRAINE OR SICK HEADACHE, BILIOUS HEADACHE, OR BLIND HEADACHE.

Pain in the head, limited more or less to one side of the head, with more or less disturbance and prostration.

Causes.—Heredity; overwork; worry; anxiety; insufficient sleep; mental labor; eye-strain; dyspepsia; irritation of the ovaries or uterus; and many other undetermined causes.

Prognosis.—Seldom permanently cured; but free from danger to life. Susceptibility to this form of headache increases with age.

Symptoms.—Preceded for a day or two by digestive disturbance and feeling of weariness and exhaustion, and heaviness over the eyes. Sensation of chilliness; nausea, sometimes vomiting; soreness in the muscles over the body; sensitiveness to light; pain of a sharp, shooting, pulsating character; face pale or flushed; pain on the left side, in front, on the temple, or at the back of the head; not often the pain is on the right side or on both sides. Moving, sound, and light become intolerable. These sensations of pain and discomfort are followed by intervals of rest and freedom from pain.

Treatment.—The attack may sometimes be aborted by:—

Antipyrine,.....10 grains.

Or:—

Phenacetine,.....10 grains.

If due to eye trouble, a competent oculist should be consulted. For the attack, the following will be found of benefit:—

Bromo-Caffeine; a dessert-spoonful in half a glass of water every half hour for four or five doses, and

Bismuth Subnitrate,.....80 grains.
Dilute Hydrocyanic Acid,.....8 drops.
Cinnamon Water,.....1 ounce.

Mix and take one teaspoonful every two hours until nausea and vomiting subside.

If due to anæmia, see "Anæmia," page 439. If due to cold, warm

applications, hot drinks, a brisk cathartic, preferably a dose of salts, and the following to relieve pain:—

Dover's Powder,.....5 grains.
Sweet Spirits of Niter,.....15 drops.

Every three hours until relieved.

Or:—

Antifebrine,.....10 grains.
Caffeine,.....4 grains.
Potassium Bromide,.....4 grains.

Divide into four powders. Take one every half hour until relieved.

Or:—

Phenacetine,.....10 grains.
Citrate of Caffeine,.....5 grains.
Monobromated Camphor,.....20 grains.

Make 10 such capsules and take one every two hours until relieved.

Menthol pencils applied locally to the seat of pain and the inhalation of camphor are often beneficial.

The diet must be carefully watched during the interval, for indiscretions in eating are often the direct cause of an attack. The use of tea, coffee, tobacco, and alcohol must be stopped or limited in quantity.

When due to malaria, treat the cause. (See "Malaria," page 406.)

RHEUMATIC HEADACHE.

Pain in the back and front of the head.

Causes.—Exposure to cold and draughts; dampness; lowered vitality; heredity.

Symptoms.—Pain in the back and front of the head; distinguished from neuralgia by being on both sides of the head, made worse by moving the muscles, and by the absence of any point of especial tenderness. The pain is most often felt at night when the patient is warm in bed. The pains shoot from point to point and, when they follow the jaw downward, mastication causes intense pain.

Treatment.—Use light diet and abstain from animal food; give attention to the clothing; keep the body and feet warm and dry. When the pain is great, use hot fomentations or mustard plaster on the back of the neck, and give a gentle purgative at night. The following liniment is found very beneficial:—

Soap Liniment,.....2½ ounces.
Liquor Ammonia,.....½ dram.
Laudanum,.....½ ounce.

Mix and apply to the part.

Or:—

Oil of Wintergreen,.....1½ drams.
Alcohol,.....2 ounces.

Rub thoroughly into the parts affected.
Internally administer

Sodium Salicylate,.....10 to 15 grains

Take in half a glass of water, every hour until relieved, or for six doses.

CONGESTIVE HEADACHE.

Cause.—This proceeds from a congested state of the vessels of the brain, an overfulness of blood or a weakness of the nerve forces, or from an excessive nervous irritability, which frequently affects circulation.

Symptoms.—Whichever of these may be the cause, there is nearly always a dull pain over the whole of the head. When it arises from an overloaded condition of the vessels, there is usually a flushed countenance with bloodshot eyes and a flushed expression; we find, on inquiry, also a sluggish liver, congested brain, and a tendency to apoplexy or paralysis. A very effectual remedy for removing pain is:—

Acetanilid,.....3 to 5 grains.

Or:—

A tablet containing Acetanilid, Camphor, and Caffeine; known as Migraine Tablet.

Or:—

Bromide of Potash in 15 grain doses.
Repeat only once after two hours.

PERIODIC HEADACHE OR BROW ACHE, BROW AGUE,

As it is variously called, is an intermitting pain, which comes on at periods more or less regular, and is confined to the brow. It will nearly always yield to full doses of quinine, especially if due to malaria. Frequently brow ache or frontal headache, as it is sometimes called, is due to

constipation and prompt relief follows purgation with castor oil or Epsom salts.

ORGANIC HEADACHE,

Resulting from actual disease of the brain, is rare, and when it does occur, only a palliative mode of treatment can be adopted. Sedatives, such as opium and bromides, may, for a time, relieve the most intolerable anguish, but they will not touch the disease itself.

Citric acid, or lemon juice, is often of great service in easing pain. Put a teaspoonful or two in a glass of cold water and drink it.

THE HEADACHE OF NEURASTHENIA OR OF NERVOUS DEBILITY

Is a very common type of headache in which the patient feels as though a constricting band were about the head, or experiences a sense of pressure on top of the head, or dull pain at nape of neck. It is usually most severe in the morning, disappearing as the day advances. For treatment, see Neurasthenia, page 426.

HEADACHE OF EYE-STRAIN

May be of the type described under Migraine, or it may take the form of pain all over the forehead and a sense of pressure at the nape of the neck.

For treatment the patient should consult an oculist.

ANAEMIC HEADACHE.

This is due to an impoverished state of the blood. The pain may be felt immediately over each eyebrow with a sense of weight or pressure on top of the head and at the base of the brain.

For treatment of this type, see Anæmia, page 439.

HEADACHE DUE TO DISEASES OF THE KIDNEY.

The pain may be felt anywhere in the head and may be of a shifting, pulsating, or wave-like character, and is accompanied by ringing in the

ears and dizziness. The complexion is doughy or pasty. Puffiness of the lower eyelids may be apparent. For this condition a physician should be consulted without delay.

RINGWORM OF THE SCALP OR TINEA TONSURANS.

A contagious disease of the scalp of a parasitic nature, in which bald spots ringed around with minute water blisters appear.

Cause.—It is produced by a fungus or vegetable organism which is known as *trichophyton*. This burrows into the follicles of the hair and the skin of the scalp, and the disease is highly contagious. It may be contracted from ringworm in other parts of the body. It is almost wholly confined to young persons before the age of puberty.

Symptoms.—It appears in small patches upon which minute water blisters form, and from which at a later period the skin or crusts peel or scale off. The hair becomes brittle in the parts affected and is broken off close to the skin, leaving a circumscribed area covered by a short stubby growth or a bald spot with very much the appearance of the flesh of a plucked fowl. The color of the parts involved becomes red or greenish yellow, and unless the disease is checked the skin becomes raised, puffy, and presents raw, inflamed points which discharge a sticky yellowish secretion. Itching is always a prominent symptom.

Prognosis.—Without treatment it may persist for years, or until the age of puberty, when it seems to exhaust itself and to gradually subside. Even under treatment it is liable to recur up to that age.

Treatment.—The hair should be cut close to the skin and the parts thoroughly cleansed with tincture of green soap and hot water. After drying well (the patient's towel should not be used by another until thoroughly boiled), the parts may be anointed with blue ointment once daily; or the following:—

Peruvian Balsam,.....½ ounce.
Salicylic Acid,.....20 grains.
Resorcin,.....20 grains.
Vaseline, ...3 ounces.

Mix and apply twice daily.

In addition the scalp should be rubbed every morning with the following:—

Oil of Turpentine,.....2 drams.
Spirits of Camphor,.....3 ounces.
Ammonia Water,.....1 dram.

Or:—

Boric Acid,.....20 grains.
Flowers of Sulphur,.....20 grains.
Vaseline,.....1½ ounces.

Mix and apply night and morning.

Cases which do not yield to this treatment should then be treated with:—

Caustic Potash,.....9 grains.
Carbolic Acid,.....24 grains.
Hydrous Wool-fat,.....½ ounce.
Oil of Theobroma,.....½ ounce.

Rub only a small amount of this into the scalp night and morning. It is better not to shave the parts when this is applied, as it is retained more completely by the hairs.

Or:—

Ointment of Boric Acid,.....2 ounces.
Ointment of Eucalyptol,.....2 ounces.
Oil of Cloves,.....½ dram.
Glycerine,.....Sufficient to make an ointment.

Rub well into the scalp night and morning.

BARBER'S ITCH OR RINGWORM OF THE BEARD.

A disease which affects the hairy portion of the face and neck in the adult male. The hair, follicles, and skin tissues are affected by a fungous growth so as to produce pustules or conical elevations.

Cause.—It is produced by the same fungous growth (the *trichophyton*) as produces ringworm. It is usually contracted in barber shops from an unclean razor or brush.

Symptoms.—It begins with one or more reddish scaly patches. They soon show little conical elevations, which mature at the top, and surround a single hair. They are at first of a pale yellowish color. After a few days they burst, and the matter, as it runs out, forms hard brownish crusts. The crusts fall off in a week or two, leaving purplish sluggish pimples behind, which are usually a long time in disappearing.

Prognosis.—The disease is extremely chronic and is very likely to return unless completely cured.

Treatment.—Soak the crusts of the pustules with olive oil or almond oil to soften them. Then wash them with green soap and water and

remove them. The face is then carefully and fully shaved. This will be a painful operation the first time. The face is then bathed in water as hot as can be borne. Each mature pustule is opened with a fine needle. Sponge the face and neck with the following wash:—

Hyposulphite of Soda,.....1 dram.
Water,.....1 ounce.

The face is again washed in hot water and thoroughly dried. Anoint the face with the following ointment:—

Sulphur Ointment,.....1½ drams to the ounce.

Allow this ointment to remain on the parts all night. In the morning wash off the ointment thoroughly with soap and water. Then apply the solution of hyposulphite of soda and dust on an ordinary face powder. Treat the face in this way every night and morning, shaving when the beard is long enough. The razor must be in good condition. The contagious nature of the disease must be remembered and all possible cleanliness observed.

DISEASES OF THE EYES.

GRANULAR LIDS OR TRACHOMA.

An infectious inflammation of the mucous membrane covering the inner surface of the eyelid (the conjunctiva).

Causes.—It is probably caused by a germ, the growth of which is encouraged by uncleanliness.

Symptoms.—The mucous membrane is covered with small granulations (minute rounded bodies like grain). These are at first quite distinct, but, as the disease progresses, they run together forming hard masses which irritate the eyeball and cause inflammation and ulceration. There is redness and swelling of the mucous membrane and a flow of matter which causes the lids to stick together. There is the sensation of the presence of a foreign body in the eye; more or less severe pain; sensitiveness to light; and copious flow of tears.

Prognosis.—The disease is very serious, as it often causes loss of sight or necessitates prolonged treatment.

Treatment.—Cleanliness and reduction of the swelling and inflammation are the ends sought in the treatment. If only one eye is infected

the patient must use all possible precautions to prevent the disease spreading to the other. Other persons may also contract the disease from him. So the greatest care in the matter of towels, etc., must be enjoined. Bathe the eyes frequently with hot boric acid solution (a teaspoonful of boric acid to a pint of water), invert the lid and gently rub it with a smooth piece of dry sulphate of copper. The lid should be kept open after the application until the eyeball is syringed with warm water, to remove from it any of the solution caused by the flow of tears acting on the sulphate. There will probably be great smarting of the eye, and increased redness of the white portion, which must be suffered to subside before the application is repeated.

Or the following excellent ointment may be used:—

Sulphate of Copper,.....8 grains.
Salicylic Acid,.....8 grains.
Cocaine Muriate,.....8 grains.
Vaseline,.....10 drams.

Mix, and rub into the inverted eyelid three times daily.

STYE OR HORDEOLUM.

A suppurating inflammation of the glands of the eyelid.

Causes.—A stye is frequently associated with a condition of debility. Scrofulous and anæmic young people are very subject to this disease. Blepharitis, inflammation of the eyelids, may cause a stye by reason of the uncleanly accumulation of scales and crusts which become favorable sites for germs.

Symptoms.—Swelling and redness occur over the gland for a few days, then a red pimple appears which itches intensely and soon fills with matter.

Prognosis.—An internal stye is more painful and of longer duration than an external stye. The course, however, is short. More than one stye may be present at the same time.

Treatment.—The following ointment, if used early, will abort styes:—

Red Oxide of Mercury,.....4 grains.
Olive Oil,.....4 drops.
Vaseline,.....½ ounce.

Mix and rub in twice daily.

If the stye is fully formed a few of the winkers should be pulled out

to allow the pus to escape and the lids should be bathed frequently with very hot boracic acid solution (one teaspoonful to a pint of hot water).

Peroxide of hydrogen, full strength, may be applied on a piece of absorbent cotton. After having thus cleaned the lid, the above ointment should be used. As the condition is frequently associated with debility the treatment laid down for anæmia should be employed. (See Anæmia, page 439.)

WATERY EYE.

If we look closely at the inner corner of the eyelids, we may perceive a little point at each, which is the opening of a duct that runs into the nose. These openings convey the tears from the eye; every time the eye is shut in winking the fluid is forced into those pipes. Now, when either or both become so thickened as to be stopped up, the tears, of necessity, fall over the cheek; this is called a watery eye.

Cause.—Usually caused by taking cold.

Treatment.—As the cause of this disease is most commonly inflammation, it may be relieved in its early stages by a plan directed toward the lessening of that inflammation, and the best is as follows:—

Pure Water,.....2 ounces.
Sulphate of Zinc,.....4 grains.
Laudanum,.....½ dram.

Mix and apply frequently. Cold must be strictly avoided. If the trouble does not yield to this remedy consult a physician or oculist.

BLEAR EYE.

A term given to an inflammatory appearance of the eyelids and corner of the eye itself.

Causes.—Advancing age, cold, or temporary weakness. It is also caused by hereditary taint, and resolves itself into a constitutional defect.

Treatment.—Where it is not constitutional, use the following lotion:—

Sulphate of Zinc,.....5 grains.
Water,.....2 tablespoonfuls.

Mix. Moisten the eye frequently with a linen cloth.

Another good remedy is to take an active aperient of calomel and rhubarb, and to bathe the eye with poppy-water. If the eye should feel

weak after the inflammation has subsided, bathe it frequently during the day with a lotion composed of sugar of lead, one grain, to a large tablespoonful of water.

WEAKNESS OF THE EYES.

These excellent washes for ordinary weakness of the eyes will prove very beneficial:—

Sulphate of Copper,.....15 grains.
Camphor,.....4 grains.
Boiling Water,.....4 ounces.

Mix, strain, and when cold make up to four pints with water. Bathe the eye night and morning with a portion of the mixture.

Or the following:—

Spirit of Mindererus,.....1 ounce.
Rose Water,.....7 ounces.

Mix and use as an eye-wash occasionally.

Or this:—

White Vitriol,.....10 grains.
Elder Flower Water,.....8 ounces.

Mix and apply as occasion may demand.

INFLAMMATION OF THE EYE OR CONJUNCTIVITIS.

Inflammation of the mucous membrane which covers the front portion of the ball of the eye and also lines the lids and margins of the latter. It varies in severity according to the extent of the part involved.

Causes.—The most common cause is exposure to cold. The disease appears to be epidemic in the spring of the year, and there is every indication that it is of infectious origin by bacilli.

Symptoms.—In the simpler form, known popularly as "pink-eye," there is redness, smarting, and sensitiveness to light. There is also the sensation of a foreign body in the eye, which is probably due to the accumulation of mucus into strings. Burning and itching of the lids are present. The secretions which accumulate on the lids during the night dry and glue the lids together.

Treatment.—Simple cases are to be bathed with warm water or in:—

Boric Acid,.....1 teaspoonful.
Warm Water,.....1 pint.

Bathe the eyes with this every two hours.

Severe cases with discharge of mucus and pus, swollen membrane of the eyelids and eyeball, sometimes subside in from three to ten days under the treatment given above.

GONORRHOEAL INFLAMMATION OF THE EYE.

A form of conjunctivitis due to the presence of the germ of gonorrhoea, the *gonococcus*.

Cause.—The presence of the *gonococcus,* the germ of infection of gonorrhoea.

Symptoms.—The lids are swollen, red, and stuck together with a thick, creamy, or greenish-yellow discharge, which escapes from the lids and runs down on the face. There is much pain and heat until the discharge flows freely. The disease occurs in newborn children through infection from the vaginal cavity in birth.

Prognosis.—The severity depends on the general health of the patient and the extent to which the cornea is involved. The great danger is perforation of the cornea and loss of sight. The eye is very subject to complications even after an apparent recovery from the attack.

Treatment.—The disease is too severe and dangerous to permit of any but professional attention. There is, however, the greatest need of cleanliness and all means to prevent contagion. The saturated solution of boric acid, previously mentioned, will be very helpful in keeping the eye free from the discharge and in allaying the inflammation. Every effort must be made to prevent contagion to the other eye if only one is involved.

ABORTED STYE OR CHALAZION.

A tumor of the eyelids resulting from retained secretion in the gland.

Cause.—Infection of the glands of the eyelids.

Symptoms.—A small growth about one eighth of an inch from the edge of the lid. It is marked by absence of pain and causes no inconvenience. There may be a single tumor or several together. They do not inflame or suppurate as true styes do.

If small they may remain; but, if large, they may cause irritation by friction in winking.

Treatment.—Small chalazia call for no treatment; large ones are cut into and the contents removed.

INFLAMMATION OF THE EDGE OF THE EYELIDS OR BLEPHARITIS.

Inflammation of the follicles or ducts along the margin of the lid.

Causes.—Neglect of cleanliness; exposure to irritating agencies, dust, heat, winds; anæmia; scrofula; eruptive fevers; and overflow of tears.

Symptoms.—Redness of the lids and crusts at the root of the eyelashes caused by dried secretions.

Prognosis.—The lashes which fall or are pulled out during this disease will grow in again in the form of the disease known as Blepharitis squamosa, but in Blepharitis ulcerosa they do not return. Chronic catarrhal conjunctivitis, a stye, loss of the lashes, and overflow of tears may result.

Treatment.—Strict cleanliness; bathe parts with solution of boric acid (one teaspoonful to a pint of hot water). After having removed the crusts in this way, the following ointment should be rubbed well into the edge of the lid each night on retiring:—

Yellow Oxide of Mercury,.....4 grains.
Vaseline,.....1 ounce.

Or:—

A little red precipitate ointment rubbed into the roots of the lashes, when the lids are closed on retiring to rest. This may be repeated every night until no longer required.

Sometimes the hairs on the lids grow inward and cause great irritation of the balls. Collodion brushed over the lids will, as it dries, cause contraction of the skin and so draw the hairs outward, but this is only a temporary relief, and the application must be frequently repeated. Surgical aid must be sought.

CATARACTS.

An opacity of the lens of the eye or of its capsule or of both. Cataracts are either partial or complete, and either stationary or progressive. As to their origin they are classified as: Congenital or inherited; Infantile, the result of rickets; Senile, due to old age; Diabetic, accompanying diabetes; Traumatic, the result of injury; Complicated,

due to disease in other parts of the eye; and Secondary, when they return after operation. They are also closely classified according to location or to the part affected. There is also a division into Hard and Soft cataracts.

Causes.—The name cataract was given to the disease under the impression that some semi-solid matter was exuded from the eye and fell down over the parts in the form of a waterfall. The causes, so far as known, are indicated in the names given to the several forms. Senile cataract is caused by an actual change which old age brings about in the eye. Diabetic cataract is the result of that disease. Traumatic cataracts are caused by an injury to the eye. These injuries are of various sorts and natures: blows, stroke of lightning, wounds of the eye tissues, and the entrance of foreign bodies. Infantile cataract seems to be the result of malnutrition in rickets. The time of development of a cataract varies from a few hours to twenty years. In some cases the changes are so slow that they seem to be stationary.

Treatment.—The removal of the growth is the only relief when there is danger of loss of sight. This operation is either by cutting or plucking the growth out. It is usually successful.

EYE BRUISES OR BLACK EYE.

Causes.—A contused wound caused by some injuring agency such as the fist, or by coming in violent contact with some object, is attended by the rupture of vessels and the escape of blood into the loose cellular tissue of the eyelids. The swelling is sometimes very marked and may be sufficient to completely close the eye. The tissues are at first stained a reddish purple color, changing as the swelling subsides to a darker greenish hue, through yellow to the natural tint as recovery takes place. Sometimes suppuration takes place and the bruised tissue has to be opened and dressed with strict antiseptic care.

Treatment.—The following lotion will quickly promote resolution:—

Dilute Acetic Acid,.....5 ounces.
Tincture of Arnica,.....1 ounce.
Ammonium Chloride,.....1 ounce.
Boiled or Distilled Water,.....5 ounces.

Mix and apply locally by means of compresses wet with this solution.

The reduction of the swelling and prevention of the discoloration may be accomplished by immediate and constant use of either hot or cold applications.

PROTRUSION OF THE EYEBALL OR EXOPHTHALMOS.

Causes.—This may result from a variety of causes. One or both eyes may be protruded from hemorrhage within the orbital cavity. Tumors, cancer, outgrowths of bone and enlargement of the lachrymal glands may cause the eye to bulge outward. The most common cause, however, is a disease of the nervous system associated with enlarged thyroid gland (goitre). This condition is known as exophthalmic goitre or Graves' disease.

SINKING OF THE EYEBALL.

Causes.—One or both eyes may sink into the orbital cavity by reason of absorption of the fatty tissue behind the eyeball. This occurs in certain wasting diseases, fevers, and imperfect circulation of blood in the vicinity of the eye.

Treatment.—The treatment of this condition is that of its cause, but in general it may be stated that rest and nutritious diet combined with such medicinal treatment as quinine, strychnine, iron, arsenic, etc., will be of great benefit. These remedies may be administered in the form of pill or capsule as follows:—

Strychnine Sulphate,.....½ grain.
Iron Arsenate,.....2 grains.
Quinine,.....24 grains.
Extract of Licorice,.....24 grains.

Mix and make into twenty-four pills or capsules and take one after each meal.

SQUINT OR STRABISMUS.

A deviation of one of the eyes from the right direction so that both of the eyes are not directed towards the same object at the same time.

The varying amount and direction of this deviation from the proper direction gives rise to several sorts of squint. They are classified as follows:—

Paralytic Squint is due to the paralysis of the muscles which control the movement of the eye.

Spastic Squint is that form which is produced by spasms or sudden contractions of the muscles of the eye.

Constant Squint is that form which is always noticeable.

Periodic Squint is noticeable only at times such as when looking at near-by objects.

Intermittent Squint occurs at more or less regular intervals.

Unilateral Squint affects but one eye.

Alternating Squint affects both eyes alternately.

Convergent Squint is the turning of one eye inwards towards the nose.

Divergent Squint is the outward turning of the eye towards the temple.

Treatment.—This is adapted to the cause and consists of correcting the refraction of the eye by the use of proper mechanical devices; by absorbents and other medicinal agents in cases of paralysis and of spasms; and by a surgical operation. The operation is called both strabotomy and tenotomy. It consists of cutting the muscles which control the movements of the eyes so as to secure uniformity of motion. This is not performed in the case of children until they are six years old. This is the age at which they begin to use the eyes in school and in near work. Prior to that age the treatment is corrective and preparatory to the operation.

If the sight of both eyes is equally good, all of the objects are seen double; but if the sight of one is much better than that of the other, the mind attends to only the clearer impression and disregards the other. This disregard may lead to dimness of vision (amblyopia) in that eye. To correct this, or to prevent it, a bandage is worn in childhood over the stronger eye to enforce the use and development of the latter. It is customary to operate on the poorer eye first, and, after this has improved, the stronger eye is then treated. This method gives the patient the use of one eye nearly all of the time. As it is a matter of nice adjustment, sometimes a second operation is necessary.

The treatment of strabismus due to paralysis of the muscles of the eye will depend upon the cause. If it is caused by rheumatism it will respond to the treatment of that disease by salicylates and diaphoretics (medicines which produce perspiration). Consumption, diphtheria, diseases of the base of the brain, diabetes, injuries, and exposure to cold are among the other causes of this form. The trouble usually responds sooner or later to the successful treatment of the disease.

DISEASES OF THE EAR.

EARACHE OR OTALGIA.

Causes.—This may be of neuralgic origin, or it may be due to acute or chronic inflammation of the middle ear, a condition which frequently complicates scarlet fever, measles, diphtheria, tonsilitis, and influenza. It is often brought on by exposure to colds or draughts. It is not uncommon during the period of teething in children and is especially severe while cutting their permanent teeth. Grown persons sometimes suffer from it while cutting their wisdom teeth. There is not often much constitutional derangement, though the pain may be sufficiently severe to render the patient unable to attend to his daily affairs.

Treatment.—When of neuralgic origin, the following will be helpful in relieving pain:—

Tincture of Belladonna,.....2 drams.
Laudanum,.....2 drams.

Mix and put five drops in the ear several times a day.

Or:—

Chloroform,.....3 drops.
Expressed Oil of Almonds,.....4 drams.

Mix, warm, and fill the ear canal; hold until it feels warm, when the ear should be syringed with warm water.

When due to inflammation, the ear should be syringed and cleansed with peroxide of hydrogen, one part, and warm water, three parts. Then a piece of cotton saturated in this solution should be placed in the ear canal.

The ear may be syringed continuously with several quarts of very hot salt solution (one teaspoonful of table salt to a pint of hot water), and great relief experienced.

When earache is caused by an abscess, and is attended with much swelling and severe pain, hot fomentations may be used, syringing the external passage with warm water; and, after the abscess has discharged, syringe with a solution of sulphate of zinc, in the proportion of eight grains to the ounce of plain or rose water, attention being paid to the bowels. Sometimes the drum must be punctured to allow the escape of pus. With some persons any derangement of the general health will cause the formation of these abscesses, and in such cases the treatment must be general rather than local. Earache, no doubt, often proceeds

from derangement of the digestive organs, and may be relieved by active purgatives and emetics.

When a tonic is required, the following will be found very good:—

Citrate of Iron,.....1 dram.
Strychnine,.....1 grain.
Syrup of Orange Peel,.....2 ounces.
Soft Water,.....½ pint.

Mix. Dose, one teaspoonful three times a day.

In children, during dentition, lancing the swollen gums will often afford relief, especially if an aperient be given, such as rhubarb and magnesia combined with a little ginger. Older children may have three or four drops of warm olive or almond oil, with one or two drops of laudanum dropped into the ear; and take compound senna mixture, repeated until the bowels are freely opened. Should these remedies not prove effectual, a fomentation of camomiles and poppies should be applied. The heart of a roasted onion applied warm to the external orifice will sometimes afford relief. If the case is very obstinate, two or three leeches behind the ear may be tried, with the following anodyne saline aperient:—

Acetate of Morphine,.....½ grain.
Solution of Acetate of Ammonia,.....3 ounces.
Sulphate of Magnesia,.....1 ounce.
Water of Camphor Mixture,.....5 ounces.

Mix, and take two tablespoonfuls every four hours.

INFLAMMATION OF THE EAR OR OTITIS.

This is characterized by an acute and increasing pain, with tenderness on pressure or moving the jaw, accompanied by fever. Sometimes the external ear is the seat of the disease, sometimes the internal, or both may be involved. There is frequently impaired or confused hearing, and often the pain is so acute as to produce delirium. On examination, the meatus is observed to be more or less red, swollen, tender, and dry. After a time, if the disease progresses, suppuration takes place, and pus is discharged. If this happens in the inner ear, frequently the tympanum ulcerates and bursts, unless such injury is prevented by timely aid of a surgeon. If this disease is neglected it may result in loss of hearing. An obstinate discharge may remain after the other symptoms have disappeared.

Causes.—It is usually caused by cold, or exposure to currents of cold air; injudicious bathing; violent syringing or probing; scrofula; and acute diseases like scarlet fever.

Treatment.—It is to be treated with fomentations, and the repeated application of leeches. At the same time active purgatives are to be administered. The ear should also be frequently syringed with warm water, and dusted with pulverized boric acid.

Or:—

The ear may be syringed twice daily with creoline solution (a teaspoonful of creoline to a quart of water) and, after drying, this powder blown into the ear canal:—

Salicylic Acid,.....8 grains.
Powdered Boric Acid,.....4 drams.

Or:—

After syringing wtih the creoline solution, five to ten drops of the following may be allowed to run into the ear:—

Ichthyol,.....2 drams.
Boiled or Distilled Water,.....2 drams.
Glycerine,.....2 drams.

Tonic treatment internally will be of service such as, cod liver oil, syrup of hypophosphites, or syrup of the iodine of iron. The last is given in doses of from 15 to 30 drops in water three times daily.

If there is any catarrhal disease of the nose or throat the same should be treated as advised under Nasal Catarrh, page 329.

For chronic cases the following is highly recommended:—

Cleanse the ear thoroughly by syringing with hot water; dry well and paint on lightly:—

Carbolic Acid Crystals,.....15 to 75 grains.
Pure Glycerine,.....2½ drams.

When the discharge lessens the following application is to be used:—

Pure Glycerine,.....2½ drams.
Mercury Perchloride,.....3 grains.

ECZEMA OF THE EAR OR TETTER.

Symptoms.—An inflammation of the skin around or within the mouth of the ear canal accompanied by more or less itching and a watery discharge with the formation of crusts, or small scales.

Treatment.—The treatment of the condition is as follows:—

Vaseline,.....2½ drams.
Oil of Cade,.....15 drops.

Or:—

Vaseline,.....5 drams.
Starch,.....2½ drams.
Zinc Oxide,.....2½ drams.
Salicylic Acid,.....7½ grains.

Wet applications should not be employed under any circumstances.

WAX IN THE EAR.

Symptoms.—When this substance becomes too hard or abundant, there will be cracking or hissing noises in the ear, and generally deafness to a considerable extent.

Treatment.—In this case the ear should be syringed with warm soapsuds. If this does not soften the wax put two or three drops of glycerine in the ear at night and syringe again in the morning. Repeat until the wax is removed.

Or:—

Fill the canal with olive oil. After an hour or so syringe with warm water.

Then the ear may be cleansed with solution of peroxide of hydrogen, one part to three of water.

FOREIGN BODIES IN THE EAR.

First: Insects occasionally make their way into the external ear, particularly of children, when lying on the grass. They sometimes produce horrible torture by irritating the drum of the ear.

Second: A disease that may be acute or chronic is due to the presence of vegetable parasites which, acting as foreign bodies in the ear, cause considerable itching, pain, vertigo (dizziness), and deafness.

These parasites appear as yellowish or black spots on the walls of the ear canal.

Treatment.—To Remove Insects: Let the child recline with the opposite ear upon a pillow, and fill the affected one with sweet oil. There is no insect that will not perish, or make good its retreat, when this method is pursued.

Solid substances are frequently pushed into the ear by children, where, if large, they sometimes occasion much inflammation and become firmly wedged by the swelling. Great danger of destruction to the drum and small bones of the ear results from awkward attempts at removing such substances, by which they are driven still deeper into the canal. If the foreign body have any visible projecting point, of which a firm hold can be taken, this may be seized by forceps, or pincers, and the body removed directly; but when the substance is rounded, or formed with many faces, or extremely smooth and cylindrical, it is very wrong even to attempt its removal by any such means. Cherry stones, apple seeds, common beads, garnets, bugle beads, and pieces of red coral, furnish many cases in point.

If we attempt to seize them in front, they instantly slip farther in, and endanger the drum. We must get behind them and hook them out, always with great caution. Sudden and severe pain warns us when we touch the drum of the ear, and then all considerable pressure inward must cease. When the foreign body is small in proportion to the size of the canal, it may generally be removed by means of the little steel ear-picker on the handle of the common pocket tweezers; but, when larger, the eye of a fine bodkin, or silver probe, should be gently curved and inserted beyond the body to draw it forward. A few drops of sweet oil, previously dropped into the ear, will very much facilitate the operation.

As children sometimes fancy things have got into the ear when they really have not, it is best to institute an examination before attempting their removal. This may be done by drawing the upper lobe of the ear upward and backward, which will have the effect of straightening the curved passage so that the eye can discern the drum at the bottom, unless there is an interposing object.

To Remove Vegetable Parasites: Syringe the ear with warm water, after which fill the canal with alcohol and dry thoroughly. This treatment should be continued every two or three days until the growth disappears.

POLYPUS OF THE EAR.

Polypus of the ear is by no means an uncommon form of the fungoid growth, which sometimes occurs in several of the internal tissues.

Symptoms.—It is of a jelly-like consistency, and a whitish yellow color, and is attached to the membranous lining of the ear. There are

also granulations of fungus which sometimes shoot up from the membrane, and are distinguished by their reddish hue from polypi.

Treatment.—These may generally be removed by being held firmly with a pair of forceps, and then gently twisted and pulled at the same time. This should only be done by a properly qualified person, as much mischief may result from the unskillful application of the forceps to so delicate a part. Sometimes, when the polypus is in the external passage, and not far up, it may be destroyed by application of chromic acid, or burnt alum, applied with a camel's-hair brush.

NOISES IN THE EAR.

Noises in the ear, like the distant sound of bells, roaring of the sea, hissing, singing, etc., are often indicative of a determination of blood to the head. With some, mere derangement of the digestive organs will cause these noises. When accompanied by a certain degree of deafness, they are generally occasioned by an accumulation of wax in the external passage, or a partial stoppage of the Eustachian tube by cold. When the noises become chronic, or long continued, bathing the head regularly every morning with cold water will sometimes remove them. If cold be the cause, or disordered stomach, they will pass away with the temporary ailments which occasioned them.

DISEASES OF THE NOSE.

COLD IN THE HEAD OR CORYZA

Is an inflammation of the lining membrane of the nose and cavities in the head which communicate with the nose. It is attended by a sense of fullness in the head, sneezing and a discharge which at first is watery, later is mixed with mucus, which eventually becomes thick and yellowish.

Causes.—Exposure to cold, dampness, and irritating vapors.

Symptoms.—The attack is usually preceded by feeling of general malaise (tired feeling), and some brow ache; chilliness and fever; sneezing and a watery discharge from the nose. The catarrhal inflammation causes the tear tube to be stopped up so that the tears flow over the cheeks and the eyes become red and watery. If the inflammation extends into

the Eustachian tube, which communicates from the throat to the ear, there may be more or less deafness. If the condition involves the throat there may be some cough. The condition usually lasts from one to two or three weeks.

Treatment.—A hot mustard foot-bath, hot drinks such as hot lemonade, ginger tea or plain tea with cayenne pepper, a prompt purge, preferably Epsom salts, Dover's powders in 4 to 8 grain doses every two or three hours to cause sweating and dry up the secretion, and the following inhalation:—

Compound Tincture of Benzoin,.....1 ounce.

A teaspoonful of the tincture to a pint of boiling water, and inhale through a paper cone every half hour until the fullness in the head is relieved.

Or the following powder snuffed into the nostrils three times daily is of benefit:—

Sulphate of Quinine,.....8 grains.
Salicylate of Bismuth,.....8 grains.
Boric Acid,.....15 grains.
Powdered Starch,.....3 drams.

Or:—

Menthol,.....7 grains.
Boric Acid,.....5 drams.
Vaseline,.....3½ ounces.

Mix and apply as an ointment to the nostrils two or three times daily.

CHRONIC NASAL CATARRH.

A chronic inflammation of the lining membrane of the nose associated with dropping of mucus into the throat with impairment of sense of smell and hearing.

Causes.—May follow cold in the head when the same has been of frequent occurrence; breathing irritating dust and vapors; syphilis; and scrofula.

Symptoms.—Sense of fullness and swelling in the nose, swelling of the soft palate, dropping of mucus into the throat. The patient awakens in the morning with a plug of mucus in the throat which is dislodged by hawking and coughing. The voice has a peculiar nasal twang; brow ache is quite common; and there may be disagreeable sense of smell in the nose more or less constant. If the tear ducts are closed, the tears flow over the cheeks.

A cure is seldom effected except by change to a warmer and dryer climate.

Treatment.—The nasal cavities should be syringed or sprayed with a solution made by dissolving one Seiler's tablet in two ounces of warm water. This solution should be made fresh each time used. After having cleansed the nasal cavities with this solution or with glyco-thymoline, one part to three parts warm water, the following oil should be used in an oil atomizer:—

Menthol,.....8 grains.
Camphor,.....5 grains.
Olive Oil,.....1 ounce.

Dobell's cleansing solution is composed of:—

Carbolic Acid,.....1 grain.
Bicarbonate of Soda,.....5 grains.
Biborate of Soda,.....5 grains.
Glycerine,.....1 dram.
Water,.....1 ounce.

Spray this into the nostrils.

After these cleansing solutions one of these snuffs may be used:—

Boric Acid,.....30 grains.
Subnitrate of Bismuth,.....2 drams.
Hydrochlorate of Morphine,.....1 grain.

Or:—

Powdered Bloodroot,.....1 dram.
Tannic Acid,.....5 grains.
Powdered Camphor,.....1 dram.
Subnitrate of Bismuth,.....2 drams.

Use either of the above as snuff every three hours.

The following is a very agreeable application:—

Tincture of Benzoin,.....4 drams.
Tincture of Guaiacum,.....1 dram.
Chloroform,.....10 minims.
Tincture of Myrrh,.....½ dram.
Oil of Almonds,.....5 minims.

Apply a few drops to each nostril once a day with a camel's-hair brush.

INFLAMED AND ULCERATED NOSE.

When the lining membrane of the nose is inflamed and ulcerated, a solution of carbonate of soda in warm water thrown up by a syringe will

be of service. If the purulent discharge be offensive, a few drops of the solution of chloride of soda or lime should be added to this.

NOSEBLEED OR EPISTAXIS.

Persons of a sanguine temperament and full habit of body are often subject to this disease. It ought to be regarded as beneficial, unless from a fullness of the veins and a tendency of blood to the head, are often excessive. Those who are troubled with vertigo and headache, arising relieved by bleeding from the nose; and there can be no doubt that many a fit of apoplexy has been averted by it, and many an attack of inflammatory fever, or congestion of the brain, thus relieved.

It is sometimes due to injury as from direct violence.

Causes.—Violent exercise, great heat, blows on the nose, the long continuance of a stooping posture, and disease of the vessels conveying blood to the brain which renders them liable to rupture. It may come on without any previous warning, or be preceded by headache and a sense of heaviness, singing noises in the ears, heat and itching of the nostrils, throbbing of the temporal artery, and accelerated pulse.

It may be due to presence of polypus; chronic nasal catarrh; disease of the nasal bones; or the presence of a foreign body in the nose; disease of the heart; mountain climbing. It is also one of the early symptoms of typhoid fever.

Treatment.—When it comes on frequently and continues long, so as to cause faintness, and especially if the person subject to it be weak or advanced in years, it should be stopped as soon as possible. This may sometimes be effected by immersing the head in cold water, free exposure to cool air, and drinking cool acidulous liquids. The body of the patient should maintain an erect position, with the head thrown somewhat back, a cold piece of metal or ice applied to the neck over the spinal cord, vinegar or lemon juice snuffed up the nostrils, or an astringent wash injected into them with a syringe. It may be composed as follows:—

Alum,.....2 drams.
Acetic Acid,.....2 drams.
Water,.....6 ounces.

Or, three drams of the tincture of chloride of iron in the same quantity of water. Or, if these fail, the nostrils may be plugged with lint dipped in a strong solution of the sulphate of copper. When the bleeding has

stopped there should be no haste to remove the clotted blood from the nostrils. Do not blow the nose violently, nor take stimulants, unless there be excessive faintness, in which case a little cold brandy and water may be taken. When there is a full habit of body, cooling medicines and light diet may be safely advised.

A hot foot-bath to draw the blood to the lower extremities and ice applied to the nose are beneficial, or the following powder blown up the nostrils is a very certain remedy:—

Tannic Acid,.....20 grains.
Antipyrine,.....20 grains.
Powdered Starch,.....20 grains.

POLYPUS OF THE NOSE.

Polypus is a name given to a tumor generally occurring in the nose, but sometimes in the womb, or the ear, and so named from an erroneous idea that it had many roots or feet. It is the result of an excessive growth of the mucous membrane, and sometimes assumes a malignant character. It may be either of a soft texture so as easily to tear and bleed, or firm and fibrous, or even almost cartilaginous. The color is commonly a yellowish gray, and it has little or no sensibility, although it causes much pain by its pressure upon the surrounding parts, stoppage of secretions, etc. It is attached to the surface from which it springs by a narrow neck like a footstalk. When in the nose it interferes with the breathing, so that the patient sleeps with the mouth open. In this situation it may be destroyed by the use of such applications as chromic acid applied with a camel's-hair brush, or a little burnt alum taken like snuff, but the only safe treatment is the removal and for this a nose and throat specialist should be consulted.

FOREIGN SUBSTANCES IN THE NOSE.

Sometimes foreign bodies, such as pieces of tobacco pipe, etc., get pushed up the nose by children. If this is a bean, or anything which swells by absorption of moisture, the extraction is a matter of great difficulty. This should not be attempted by other than a professional surgeon; yet if the assistance of such cannot be readily obtained, the effort may be made by means of the flat end of a probe or a silver bodkin, bent

in about the eighth of an inch at the end, and the instrument then introduced and passed beyond the object, so as to draw it out as with a hook, when the foreign body has not penetrated far. If the opposite nostril is closed, and the child is made to blow the nose violently, it may sometimes be driven out.

COLD SORE, FEVER SORE, OR HERPES LABIALIS.

An acute inflammatory affection of the skin around the mouth and nose.

Causes.—They may be due to fever, to digestive disturbance, or to local congestion.

Symptoms.—Clusters of small areas of raised vesicles containing a clear or opaque fluid. These vary in size from a pin-point size to that of a pea. They are often preceded by heat and swelling in the locality. After a short time they crust over and disappear without leaving a scar.

Treatment.—They seldom require serious treatment, though they are often painful and always unsightly. The application of a good toilet powder dusted upon them, or cold cream, or a solution of boric acid, a teaspoonful to a pint of water, will lessen the itching and prevent contagion.

DISEASES OF THE MOUTH.

CHAPPED OR CRACKED LIPS.

The lips are often chapped and cracked by exposure to cold, and it is sometimes a difficult matter to heal them. The following is a good form for lip-salve to be used in such a case:—

White Wax,.....2½ ounces.
Spermaceti,.....½ ounce.
Almond Oil,.....3 ounces.

Melt together, stir well, and put by to cool. Apply to the lips on going to bed at night. It may be made of a pretty pink color first by tinting the oil with a small piece of alkanet root, which should be taken out before the other ingredients are introduced. When the lips heat and burn much, a little cold cream will be found a pleasant and serviceable application.

SALIVATION OR MERCURIAL STOMATITIS.

Causes.—Occurs in those poisoned by mercury when working with the same, or from overdosing.

Symptoms.—The secretions of the mouth are increased; the breath is foul; there is a bad taste in the mouth; the gums swell; are inflamed, soft; and the teeth are sensitive and may become loose. There is usually loss of appetite and diarrhœa.

Treatment.—

Creolin,.....30 drops in four ounces of water.

Use as a mouth wash every three hours.

Or:—

A small piece of alum dissolved in a little water and applied on a swab to the gums to pucker them and prevent further softening.

Or:—

Tincture of Myrrh,.....3 drams.
Chlorate of Potash,.....30 grains.
Chloride of Soda,.....2 drams.
Distilled Water,.....to make 8 ounces.

Mix and use as mouth wash every two hours.

Internally, use iodide of potash, five to ten grains in half a glass of water three times daily to eliminate the poison.

GUMBOIL.

Causes.—This sometimes arises from exposure to cold, but is caused in the majority of cases by the irritation of a decayed tooth.

Treatment.—Inflammation of the gum generally goes on to suppuration, to promote which warm fomentations and poultices may be applied externally. As soon as the matter is formed the abscess may be cut or lanced. Afterwards the mouth should be washed occasionally with an astringent lotion composed of tincture of myrrh and water, or of twenty or twenty-five grains of sulphate of zinc, dissolved in half a pint of rose water.

STAMMERING.

This defect of speech sometimes proceeds from functional disorder, sometimes from nervousness, sometimes it is the result of irritation.

From whatever cause it originates, it is in the majority of cases to be cured by an exertion of the will.

Treatment.—Stammerers, although they cannot speak a single sentence without hesitation, can sing a song of many verses as fluently as any person. It is to be recommended that those who stammer should begin with a set of exercises of commonplace sentences, chant to the first bars of the simplest melody, such as "My Country," and, from that, practise those sentences upon one note ending a note lower or higher, slowly at first, but gradually increased to rapidity.

SORE TONGUE.

The tongue is liable to become sore or ulcerated, most commonly along the edges; and there are frequently seen small pimples and cracks.

Treatment.—Take mild and cooling aperients, particularly calcined magnesia, either alone or in a Seidlitz powder. Let the drink consist chiefly of soda water, and the diet be light and cooling. Touch the sores with burnt alum and wash the mouth frequently with borax and honey dissolved in water.

INFLAMMATION OF THE TONGUE OR GLOSSITIS.

Causes.—Mechanical injury, very hot fluids, corrosive poisons, sharp edges of teeth, and irritation from tobacco pipe stems.

Symptoms.—The tongue becomes greatly swollen and is painful. There is fever, rapid pulse, and increased flow of saliva. Respiration and deglutition (swallowing) are much interfered with, and the voice is muffled.

Prognosis.—The chief dangers are suffocation and abscess formation.

Treatment.—Ice held in the mouth and the use of purgatives together with small doses of tincture of aconite, two to four drops every hour, until fever subsides or sweating is produced. If these measures fail, the tongue must be scarified deeply to afford relief. Abscesses must be opened. In chronic cases apply with a camel's-hair brush silver nitrate, ten grains to an ounce of distilled water, to the ulcerations, and administer tonics.

A good mouth wash, such as listerine or boric acid solution, should be constantly used.

DISEASES OF THE THROAT.

SORE THROAT OR ACUTE PHARYNGITIS.

Inflammation of the throat or pharynx.

Causes.—Exposure to cold; insufficient clothing; too much clothing; a too rich diet with hot drinks; obstructions in the nose and pharynx; scrofulous or gouty tendency.

Symptoms.—Pain in swallowing; persistent clearing the throat; impaired hearing; loss of taste; and mouth breathing.

Prognosis.—Nearly always very favorable when treated.

Treatment.—Sucking of ice; cold sprays; application to the throat by oil atomizer of:—

Guaiacol,.....1 ounce.
Sweet Oil,.....1 ounce.

Or:—

Menthol,.....½ ounce.
Olive Oil,.....2 ounces.

Apply by spray.

Or:—

Chlorate of Potash,.....15 grains.
Water,.....1 ounce.

Gargle frequently.

If there is reason to believe that the stomach is disordered, ¼ grain doses of calomel every two hours for four doses, followed in six hours by a full dose of Epsom salts, will be of much benefit.

"CLERGYMAN'S SORE THROAT" OR CHRONIC PHARYNGITIS.

An inflammation of the back part of the throat easily visible when the mouth is opened wide. The vocal cords and the larynx are usually affected.

Causes.—Over-exertion and improper use of the voice; inhaling irritating vapors; digestive disturbances; and excessive smoking.

Symptoms.—At first the mucous membrane is red and inflamed, and is studded with glandular follicles and lymphatic little glands. The

voice is husky and the throat is dry. There is increased difficulty in using the voice with constant clearing of the throat. There is also difficulty in swallowing.

Treatment.—This should be first directed against the underlying causes. The voice must be saved, and whatever practices cause or aggravate the complaint must be stopped. Tonic medicine, fresh air, and good diet must be observed. For local treatment use antiseptic washes in the pharynx and nose, such as Dobell's solution:—

Bicarbonate of Soda,.....1 dram.
Carbolic Acid,.....30 grains.
Glycerine,.....1 ounce.
Boiled Water,.....2 pints.

Or:—

Zinc Sulphate,.....5 grains.
Water,.....1 ounce.

Use as a gargle.

Or:—

Silver Nitrate,.....15 grains.
Water,.....1 ounce.

Use as a gargle.

A very beneficial and agreeable spray is:—

Menthol,.....2 grains.
Eucalyptol,.....1 grain.
Liquid Vaseline,.....1 ounce.

Use with an oil atomizer.

INFLAMMATION OF THE TONSILS OR TONSILITIS.

Redness and swelling of the tonsils due to inflammation of the soft tissues.

Causes.—Exposure to wet and cold; sudden changes of temperature; imperfect protection of the feet in damp weather; rheumatic or scrofulous tendencies; and previous attacks. It usually occurs in childhood and early adult life.

Symptoms.—In the simple form there is swelling, redness, difficulty in swallowing. There is usually a warning chill followed by fever from 102° to 104°; headache; and pain at the angle of the jaw. The breathing is difficult; hearing impaired; and the voice sounds distant and indistinct.

Earache sometimes appears early. The tonsils are covered with light yellow colored spots which may be hastily taken to be the membrane of diphtheria. Usually the breath is fetid.

Prognosis.—The disease usually terminates favorably; although suffocation may occur in cases of delicate children.

Treatment.—The disease may frequently be aborted during the first 24 hours of the attack by 4-minim hourly doses of tincture of aconite. This must be discontinued as soon as there is tingling in the ends of the fingers or a tickling in the throat.

If a rheumatic tendency is ascertained, 3-grain hourly doses of the salicylate of soda may be given. This may be continued until there is a decided improvement.

The patient is put to bed at once and a liquid diet is provided. Administer at once a powder of:—

Calomel,.....3 grains.
Bicarbonate of Soda,.....5 grains.

Follow it in six or eight hours with a dose of Epsom or Rochelle salts or of Hunyadi water.

The tonsils may be touched carefully with a solution:—

Nitrate of Silver,.....40 grains.
Water,.....1 ounce.

Use a camel's-hair brush or swab of absorbent cotton, taking care not to touch the surrounding parts. This may be done three times a day.

Or:—

Tincture of Chloride of Iron,.....1 dram.
Chlorate of Potash,.....½ dram.
Water,.....to make 2 ounces.

Mix. Use as a gargle every two hours, plain or diluted.

In children who cannot gargle:—

Tincture of Chloride of Iron,.....3 drams.
Glycerine,.....3 ounces.

Mix. Give one teaspoonful every two hours plain.

Should the tonsilitis become chronic, excision of the tonsils may be necessary.

When there are white patches on the tonsil, as in ulcerated sore throat, a gargle of peroxide of hydrogen, plain or diluted, is very efficient.

When the attack has subsided the tonsils may be contracted by touching them with:—

Copper Sulphate,.....20 grains.
Water,.....1 ounce.

Or:—

Monsel's Solution or Solution of Iron Sub-sulphate,.....1 dram.
Water,.....1 ounce.

QUINSY OR PERITONSILAR ABSCESS.

An abscess of the tissues surrounding the tonsils.

Cause.—This disease sometimes accompanies or terminates tonsilitis. It is inflammatory and is thought to be of the same origin.

Symptoms.—The loose connecting tissues surrounding the tonsils are inflamed, and the movements of the jaw are painful; nasal breathing is impaired; the soft palate and the uvula are swollen and inflamed. The countenance of the patient appears anxious; the mouth hangs open and saliva escapes from it.

Prognosis.—The termination of the disease is favorable.

Treatment.—The disease may often be aborted in the first twenty-four hours by use of 4-minim hourly doses of tincture of aconite. If it is not aborted, hot poultices are applied to the neck in order to promote suppuration and hasten the termination of the disease. As soon as the abscess has formed, incision is made at the side of the root of the uvula and the pus allowed to escape. Sometimes the abscess breaks of its own accord. The parts soon heal; but it is not well to wait for the spontaneous bursting of the abscess, as the deep muscles of the neck may become involved and more serious consequences develop. Warm bran or flaxseed poultices are used to promote suppuration. Acid drinks, or pieces of ice retained in the mouth, are often grateful to the hot and dry throat. Relief from pain may be procured by inhaling the steam of hot water through a teapot or an inverted funnel.

After the pus has discharged, a generous diet and tonic treatment is desirable.

HOARSENESS OR LARYNGITIS.

Inflammation of the larynx.

Causes.—Improper use of the voice; insufficient clothing; poor

ventilation; breathing irritating particles and gases; digestive disturbance; abuse of alcohol; excessive smoking.

Symptoms.—Dry cough; hoarseness; swelling and sometimes hemorrhage; mucous membrane is evenly red and swollen.

Prognosis.—If taken early and well treated, and the causes removed, the cure will in time be assured. If not, the disease will run three or four weeks and will leave the patient very susceptible to future attacks.

Treatment.—Refrain absolutely from using the voice even in a whisper. The patient should remain in one room of an even temperature of about 65° or 70°, the atmosphere of which is laden with moisture from boiling water. A bandage of cotton cloth wrung out of cold water every five hours is to be worn around the neck and held in place by a band of flannel. The compress is to be further moistened with the following solution:—

Glycerine,.....1 ounce.
Tincture of Iodine,.....1 dram.
Water,.....to make 8 ounces.

Moisten the compress twice daily.

The throat may be thoroughly rubbed with camphorated oil.

¼ grain doses of calomel may be given every two hours until four doses have been taken; then follow in six hours with a full dose of Epsom salts.

ENLARGEMENT OR SWELLING OF THE UVULA.

The lengthening and enlarging of the uvula, which hangs downward at the back of the mouth from the palate over the base of the tongue.

Causes.—A weakening or sometimes an absence of muscular fibers in the uvula. This may result from a partial paralysis of the muscles by diphtheria, scarlet fever, influenza, and similar diseases. It occurs at all ages and among speakers and singers especially.

Symptoms.—Fits of coughing at evening and in the morning; tickling in the throat with pain and discomfort; deterioration of the singing voice; hoarseness; and sometimes blood-spitting.

Treatment.—Astringent applications to shorten the uvula and to restore it to its place. Burnt alum blown against the uvula; a simple gargle of alum water; and washing with tannic acid or nitrate of silver with a camel's-hair brush will often suffice. If this is not efficacious

the uvula must be amputated. This is a simple operation in the hands of a competent surgeon.

DROPSICAL INFLAMMATION OF THE LARYNX OR OEDEMATOUS LARYNGITIS.

Inflammation of the mucous membrane of the larynx, glottis, and epiglottis, with an outpouring of blood serum into the tissues producing a dropsical condition.

Causes.—Colds; eruptive fevers; breathing irritating vapors and particles; foreign bodies; tubercular and syphilitic affections.

Symptoms.—Chill; fever; difficulty in breathing; extreme anxiety of expression; breathing inward is most difficult at first; wheezing; difficulty in swallowing; pain seems to be located at the "Adam's apple"; capillaries (minute blood vessels) in the throat very red; parts swollen.

Prognosis.—If not relieved the patient dies of strangulation in from a few hours to five days.

Treatment.—Prompt and vigorous treatment is demanded to overcome the tendency to suffocation. This is done by a physician, who scarifies the surface five or six times a day to allow the serum and fluids to run out and thus reduce the swelling. Steam inhalations and pieces of ice dissolving in the throat afford some relief. Ice bag on the neck over the seat of disease is beneficial. If pus is present it must be removed. Tracheotomy (cutting an opening into the throat from outside and the insertion of a silver breathing tube) is often necessary to save life.

DISEASES OF THE LUNGS.

COLD IN THE CHEST OR ACUTE CATARRHAL BRONCHITIS.

Inflammation of the lining membrane of the bronchial tubes.

Causes.—Sudden changes in temperature; cold winds; inhaling irritant vapors and dust; infection by micro-organisms; acute infectious diseases, such as typhoid fever, measles, etc.; heart or kidney disease; dentition in young children.

Symptoms.—Chill; a short, dry, annoying cough; soreness under the sternum (breastbone); sense of weight or oppression on the chest; slightly quickened breathing; slight rise in temperature; and a rather higher than normal pulse. These are accompanied during the first day or two by fatigue; furred tongue; constipation; and, in very young children, convulsions may be among the earliest symptoms. In a few days the pain in the chest increases and becomes tearing or burning in sensation and is aggravated by a deep breath or by coughing. The cough becomes loose and is followed by free expectoration. The sputum may be slightly stained with blood and soon becomes more abundant, of a greenish-yellow color.

Prognosis.—There are a few deaths from acute bronchitis among the very young and the very old or those who are greatly enfeebled from other causes; but the disease usually terminates favorably in about two weeks. Other cases may drag along and become chronic.

Treatment.—The treatment during the first stage of the disease consists in an attempt to allay the inflammation. Hot foot-baths, hot drinks, and the following may be taken:—

Dover's Powder,.....2 grains.

Make five such powders and take one every three or four hours.

After which:—

Wine of Ipecac,.....1 dram.
Solution of Potassium Citrate,.....3 ounces.
Solution of Ammonium Acetate,.....3 ounces.

Take a tablespoonful every two or three hours.

If the cough and pain are severe a mustard plaster may be applied front and back and the chest and back afterwards well rubbed with either ammonia liniment or chloroform liniment. If the passages are very dry and the atmosphere of the room is also dry, much benefit results from allowing the steam from a kettle of boiling water to moisten the air. The boiling water may be beneficially medicated by putting into the water in the kettle from one to two grains of menthol every three or four hours.

Or:—

Compound Tincture of Benzoin,.....1 ounce.
Oil of Eucalyptus,.....1 ounce.
Oil of Pine,.....1 ounce.

Put a tablespoonful of this mixture into the kettle of boiling water every three or four hours.

If the case is persistent and does not yield to this treatment such cases require the following:—

Terebene,.....2 drams.
Creosote,.....24 drops.
Mucilage of Acacia,.....enough to mix.
Chloroform Water,.....to make 3 ounces.

Take one teaspoonful in water every four hours.

CHRONIC BRONCHITIS.

Winter coughs, catarrh, and asthma are very common forms of this disease. For the cough give:—

Paregoric,.....½ ounce.
Syrup of Ipecac,.....1 ounce.
Syrup of Tolu,.....2 ounces.
Anise Water,.....1 ounce.

Mix and give one teaspoonful every two or four hours.

If there is fever give:—

Sweet Spirits of Niter,.....15 drops.

One such dose every two or four hours.

It is during the spring months with an east wind that bronchitis attacks young and old with greatest frequency. With old persons, in such cases, there is commonly a great accumulation of mucus in the bronchial tubes, which causes continued and violent coughing in the efforts to expel it. Breathing is difficult; the blood, from lack of proper oxygenation, becomes unfit for vital purposes and death is often a sudden termination of such cases. This form must be carefully treated; no debilitating measures will do; a warm, generous diet must be maintained; warm flannel worn next to the skin; and inhalation of steam—if medicated with turpentine or balsam of Peru so much the better.

The following mixture is of much benefit in these cases:—

Creosote,.....24 drops.
Glycerine,.....1 ounce.
Wine of Burgundy,.....to make 3 ounces.

A teaspoonful every two hours.

PLEURISY OR PLEURITIS.

Inflammation of the membranes which line the thorax (chest) and which cover and protect the lungs, called the pleura. There are three varieties with reference to the duration of the disease: acute, subacute, and chronic; and two varieties with reference to the presence or absence of liquid: dry pleurisy and pleurisy with effusion. When there is pus effused the disease is called empyema.

Causes.—The presence of a micro-organism; cold; exposure; muscular exertion; injuries to the chest walls; a secondary result of pneumonia, tuberculosis, Bright's disease, inflammation of the heart membrane (pericarditis), rheumatism, scarlatina, smallpox, and measles. Tuberculosis, cancer, Bright's disease, and alcoholism may cause chronic pleurisy.

Symptoms.—Chill; pain or "stitch" in the side; some fever; pain over the nipple is increased by breathing; patient "catches his breath" to ease the pain; breathing is short, rapid, shallow, from 30 to 35 respirations a minute; a short, dry, hacking cough, and a pulse from 90 to 120 per minute. When effusion of liquid occurs the pain is usually less severe. The patient lies on the paining side and rather crouches to get relief. The breathing may be one-sided for the same reason; this form of breathing may sometimes be seen. After the absorption of the liquid the condition is much improved and the convalescence is rapid.

In the chronic form there is a longer duration; night sweats; palpitation; greater difficulty in breathing; disturbed circulation; and some prostration.

Prognosis.—Usually the disease terminates in recovery in about three weeks. Complications often make the disease a very serious one. Empyema (pleurisy with suffusion of pus) is almost uniformly favorable in prognosis. There is in pleurisy with effusion some danger of death if the amount of suffused liquid is very large.

Treatment.—Rest and a semi-solid or liquid diet are to be first secured. The pain, if great, may be controlled by 3-grain doses of Dover's powder every two or three hours; and also by binding the thorax with strips of adhesive plaster on the painful side from the middle of the back to the breastbone. This prevents the motion of the chest in breathing and coughing. If the disease is recognized very early the seriousness may be modified by:—

Salicylate of Soda,.....15 grains.

Take one such powder in a wineglass of water every three or four hours.

After effusion of liquids has taken place the following should be given:—

Acetate of Potassium,.....30 grains.
Infusion of Digitalis,.....2 drams.

Take one such dose every three or four hours.

The use of poultices and of hot applications is of rather doubtful value on account of the very great risk which the patient runs of taking cold. Attempts to promote infusion by strong purgatives, sweating and similar means are also seldom of benefit; besides they have a weakening effect upon the patient. If the liquids do not disappear by absorption they are withdrawn by use of a needle-like tube (an aspirator). This and the withdrawal of pus in empyema are matters for the attention of the surgeon.

DROPSY OF THE PLEURA OR HYDROTHORAX.

The presence of a liquid in the pleura.

Causes.—Heart disease; kidney disease; inflammation of the liver; and consumption.

Symptoms.—The symptoms of pleurisy generally. The fact that it is generally found on both sides of the chest; that there is a history of other diseases mentioned in the causes of the disease, and that there is no fever or pain distinguishes it from pleurisy.

Prognosis.—The termination depends upon the other diseases of which this is an accompaniment.

Treatment.—The fluid may be absorbed by the use of saline purgatives and hydrogogue cathartics such as:—

Epsom Salts,.....½ ounce.

Take one such dose every morning before breakfast.

At the same time take:—

Solution of Iron and Ammonia Acetate,...2 ounces.

Take one tablespoonful every four hours.

The application of dry cups over the chest frequently affords relief. It may be necessary to withdraw the fluid by surgical means.

When air is present in the cavity of the chest, the disease is known as pneumothorax. Its treatment is along the same lines as in pleurisy.

Air and water together in the cavity produces hydropneumothorax; and pus and air together, pyopneumothorax.

ASTHMA.

This is a disease of the lungs, whose main characteristic is laborious breathing, which comes in paroxysms, and is accompanied by a wheezing noise. Humid asthma is that in which the attack terminates in expectoration; when it does not, this is called dry asthma. Persons so afflicted have generally disease of the heart or lungs; but, if not, it is called spasmodic asthma.

Causes.—Hereditary predisposition; dwelling in a cold or moist atmosphere, or being subject to sudden changes of temperature; gout; intense study; great mental anxiety; suppression of perspiration; irritation of the air-cells and lungs by atmospheric impurities; irritation of the stomach, uterus, or other viscera.

Symptoms.—The attack commonly occurs in the night, the patient having gone to bed in a listless, drowsy state, with a troublesome cough, oppression at the chest, and symptoms of flatulence. Towards midnight the breathing becomes more labored, the wheezing sounds louder, and the patient is obliged to assume an erect posture to prevent suffocation. Sometimes he starts out of bed, and rushes to the window for air, or he sits with his body bent forward, his arms resting on his knees, with a flushed or livid face, or deadly pale, gasping and struggling for breath, in a condition painful to behold. The pulse is weak and intermittent, with palpitation of the heart; sometimes there is vomiting, with involuntary emission of the urine, which is of a pale color, and relaxed bowels. The attack will probably last for two hours or more, when the severe symptoms will gradually remit, with an expectoration of frothy mucus, and a tranquil sleep follows. For some days there will be felt a tightness of the chest, and the slightest exertion brings on a difficulty of breathing; there will be slighter paroxysms, and after a longer or shorter period another severe one.

Prognosis.—Asthma is never fatal by itself; but there are complications which often terminate so. The disease is essentially chronic and can never be said to be cured.

Treatment.—The objects to be attained in this are, first, to moderate the violence of the paroxysm; second, to prevent its recurrence. Gentle aperients should be administered, and anti-spasmodic mixtures; a mustard plaster on the chest will often afford much relief. Castor oil, given in peppermint, or weak brandy and water, is a suitable aperient. Where there is reason to suppose the stomach is overloaded, an emetic should be given. Tincture of lobelia inflata is good in obstinate cases, dose one dram. Inhaling the fumes of stramonium is sometimes of service, and the good effect will be assisted by a cup of hot coffee, putting the feet in warm water, or using the warm bath.

For bronchial asthma, Gardner's syrup of hydriodic acid, a half-teaspoonful every four hours, is very efficient, together with the following:—

Stramonium Powder,.....1 ounce.
Belladonna Powder,.....1 ounce.
Hyoscyamus Powder,.....1 ounce.
Nitrate of Potash Powder,.....1 ounce.

Mix and burn on a shovel and let the patient inhale the fumes.

In asthma due to heart trouble use:—

Fluid Extract of Apocynum Cannabin,.....2 drams.
Fluid Extract Cactus Grandiflora,.....2 drams.
Gardner's Syrup of Hydriodic Acid,
enough to make 3 ounces.

Mix. One teaspoonful every four or five hours.

To prevent the return of a paroxysm of asthma, avoid the exciting causes, keep the bowels open with some mild aperient, and strengthen the system by bitter infusions, such as camomile or gentian. If there is tightness of the chest, put on a poultice, and take an expectorant now and then to clear out the phlegm from the bronchial passages. Take a light nourishing diet, avoiding everything difficult of digestion; wear warm clothing, as flannel next to the skin; take regular and moderate exercise; change of climate if possible, should the situation occupied be damp, or bleak and exposed. Do not indulge in sensual or intemperate habits.

Eclectic Treatment for Asthma.

When the symptoms appear, at once place the feet in warm water, and take a decoction of catnip or pennyroyal, to produce a gentle

perspiration. If the attack still continues, take a tablespoonful of the tincture of lobelia in a cup of warm tea, every half hour. The following remedy has produced marked results in severe cases: Take a half ounce of well-bruised seneca snakeroot; immerse in one pint of water, and boil over a slow fire till reduced to a half pint. Dose, a tablespoonful every ten or fifteen minutes. A teaspoonful of mustard-seed, taken in tea or soup, morning and evening, has cured many severe cases. Damp houses and damp air must be carefully avoided. Let the food be light and nutritious; sleep on a hard mattress; and frequently take the country air.

HAY ASTHMA OR HAY FEVER, THE ROSE.

This is a catarrhal inflammation of the respiratory tract occurring most frequently in the spring and fall.

Causes.—It is caused by the inhalation of certain vapors, the pollen of plants, and odors emanating from some animals.

Symptoms.—Those of a severe cold in the head; sneezing; watery discharge from the nose; more or less deafness; irritation of throat and nose; wheezing cough; and difficult breathing. The condition may last for a period of weeks each year, disappearing for a few days, then beginning again.

Treatment.—When disease of the nasal turbinated bones exists, their removal usually causes a cure. In other cases there is no treatment that is positively curative. A change of residence to a higher, dryer climate, or a sea voyage will sometimes overcome the condition. The medical treatment is varied. Quinine sulphate, five grains three times daily, taken for a month or so before an expected attack, has been recommended. During the attack the same treatment three times daily and an ointment containing thirty grains of quinine to the ounce applied to the nostrils is often beneficial, as is also the following:—

Extract of Hyoscyamus,.....12 grains.
Iodide of Potash,.....60 grains.
Bicarbonate of Potash,.....2 drams.
Extract of Licorice,.....4 drams.
Anise Water,.....to make 5 ounces.

Mix. Two teaspoonfuls every four hours until relieved.

BLEEDING FROM THE LUNGS OR HEMOPTYSIS.

This denotes in general the spitting of blood, and is commonly used by pathologists to signify the expectoration of blood from the lungs and air tubes. It is important to ascertain the source of the blood which escapes from the mouth, and, if determined to be from the lungs, to ascertain whether it is symptomatic of disease of these organs, or merely vicarious in its character. It is not so much dangerous in itself as it is rather an indication of some other dangerous disease, being most frequently connected with tubercular consumption.

Causes.—Bleeding from the lungs may occur without organic disease, in the plethoric and robust who live a life of excitement and excess, and in nervous, irritable individuals, weakened by mental or bodily fatigue, and leading sedentary lives. It is often hereditary, and may be brought on by violent muscular effort, paroxysms of cough, blows or pressure on the chest, inspiration of irritating vapors, or of rarefied air on high mountains. The blood may be exuded from the tracheal or bronchial membranes, or it may proceed from capillaries communicating with the air passages in any part of their extent. The amount varies from a dram to a pint at a time, and is generally florid, and more or less mixed with air, differing from the dark, coagulated blood which comes from the stomach.

Prognosis.—This is rarely a fatal disease, but death may occur from complications. If the causes is consumption or aneurism death may follow.

Symptoms.—An attack is frequently announced by a feeling of heat and oppression in the chest behind the sternum, followed by a cough which brings up the blood. When the quantity is very great it pours forth without a cough, and almost by an act of vomiting, with considerable spasmodic effort.

Treatment.—Elevating the breast and shoulders, admitting plenty of fresh air, with spare diet and perfect quiet, are among the most useful measures to be adopted. The chest should be sponged with vinegar and cold water, and a dessertspoonful of the former in half a wineglassful of the latter will be a useful accompaniment to any other medicines which may be thought necessary. The oil of turpentine, ten to thirty drops in a glass of water; or gallic acid, in doses of ten to fifteen grains, every three or four hours, have been found of great

value. Cold liquids, and the sucking of pieces of ice, will be of service. Nauseating medicines, as tartar emetic and ipecacuanha, are also frequently employed. A teaspoonful of common salt, taken frequently, is an excellent popular remedy. In all cases, calmness of mind, rest, silence, erect position, cool air, and freeness of the bowels should be enjoined. When the attack proceeds from congestion, blood-letting is recommended in certain cases. If cough be present, it should be allayed by narcotics. After the attack, astringent tonics, as iron and quinine, may be given; and the return of the bleeding is to be guarded against by avoiding the exciting causes, and attending to the general health.

LOBAR PNEUMONIA OR LUNG FEVER—WINTER FEVER.

Pneumonia is an acute infectious inflammation of the lung structure, involving not only the vascular tissues but also the air cells, which are rendered impervious to air by the disease.

Causes.—The germ of pneumonia (*diplococcus pneumoniae* of Fraenkel). Whatever debilitates the system may act as a predisposing cause. Persons suffering from malarial poison, the grip, and acute diseases are liable to attacks of pneumonia. Age, intemperance, climatic changes, impure air, and other similar factors may be regarded as agents in its production.

Symptoms.—The onset of pneumonia is sudden and the first notable symptom is usually a chill perhaps accompanied by headache and pain in the back or limbs. In a short time the chill is followed by fever, pain in the chest, shallow, rapid, and painful breathing and a short, hacking, and suppressed cough. If the ear is placed over the chest a crackling sound is heard which can be imitated by rolling a hair between the thumb and fingers. The portion of lung involved is congested with blood in the first stage, which causes a serious obstruction to the circulation; the heart is thus embarrassed in doing its work. The products of inflammation are pressed out into the air cells. In about two days after the onset of the disease, the disabled portion of the lung solidifies and percussion gives a dull sound. The temperature is much elevated, the urine is scanty and high colored. The patient wears an expression of anxiety and distress. The cough is more painful and brings up a rust colored sputum known as the prune juice expectoration. The breathing is labored and painful. The

respiration, which in health averages about seventeen a minute, runs up to forty, or in extreme cases to sixty, which indicates that the functions of the lung are greatly disturbed. In about five or six days, if the case goes on favorably, the morbid material in the air cells begins to soften and is absorbed into the circulation and removed from the system. The temperature declines, the fever abates, moisture appears upon the surface of the body, the patient feels relieved and shows marked signs of improvement. This is known as the stage of resolution and occupies from two to six days. The disease does not always follow the ordinary course. The process of inflammation may advance from one portion of the lung to another, and having traversed one lung may invade the other. Where both lungs are involved the case is one of double pneumonia, where a single lobe of one lung is invaded it is called lobar pneumonia.

If the pulse is weak and rapid, above one hundred and twenty a minute, and the temperature continues above one hundred and four degrees, the disease is severe and liable to terminate unfavorably. When the case is severe, with a brown, dry tongue, it is sometimes called typhoid pneumonia.

If the patient complains of a sharp stitch in the side, the complication with pleurisy must be considered.

Abscess of the lung sometimes follows pneumonia and recovery is tedious.

Treatment.—The treatment must be prompt and meet the symptoms as they develop. Careful attention to the symptoms, and prompt medical aid in the early stages, will generally gain the mastery of the disease.

In the onset a full dose of quinine will often reduce the temperature, produce perspiration, antagonize the poison depressing the nerve centers, and afford marked relief or even abort the disease.

A mustard poultice over the chest acts as a powerful stimulant to the cutaneous nerves, and may help to abort the diesase if used early.

In robust persons where there is no weakness and depression, one one-hundredth of a grain of tartarized antimony may be given every two hours advantageously, but should only be given in the first stages.

In the second stage carbonate of ammonia is a remedy of great use. It stimulates the lungs, and aids the respiration and circulation. Five or ten grains in fluid extract of licorice every two or four hours is a proper dose.

Acetanilid is a valuable remedy in experienced hands to lower the temperature. Its use is not devoid of danger, however.

A tendency to heart failure must be met by giving digitalis and suitable stimulants. These can be used safely and satisfactorily only by skilled persons.

Pneumonia in children above two years of age does not often prove fatal if properly and promptly treated.

Camphor liniment, flaxseed poultices, and the cotton jacket padded to oil silk are well known and serviceable remedies. Tincture of aconite in the early febrile stage is serviceable, especially in cases of children; ten drops in one-half tumbler of water, and of this mixture give one teaspoonful every half hour till it moistens the surface of the skin.

Demulcent drinks of slippery elm and flaxseed are soothing and serviceable.

Lemonade, in which is dissolved one teaspoonful of cream of tartar to a half pint, makes a cooling and refreshing drink; it also favors the secretion of urine and slightly relaxes the bowels. The patient should have pure air, the sick room being reasonably ventilated.

No one but an experienced physician should attempt to treat a case of this kind.

CONSUMPTION.

Phthisis, or consumption, is a disease which, unfortunately, is but too prevalent and fatal in this country, as in most others. It spares neither age nor sex, and its attacks, at first so insidious as almost to escape notice, too frequently lead to a fatal issue. It is the result of the formation and development of tubercles in the lungs. These first appear in the form of small, gray, semi-transparent granulations, which gradually enlarge and become opaque, and after a time empty themselves into the bronchial tubes, and thus the substance of the lung is gradually destroyed.

Causes.—The tubercle bacillus; heredity; debility and chronic diseases, like Bright's disease and syphilis; acute affections sometimes terminate in phthisis. Other exciting factors are unhealthy sanitation and certain occupations—mining, milling, etc.

Symptoms.—The disease begins insidiously with loss of appetite, dyspepsia, and more or less gastric pain after meals. The subject

becomes pale and bloodless and complains of general weakness. Later, there develops a short, dry cough, exciting no particular attention, being attributed to a slight cold. It, however, continues, and after a time increases in frequency. The breathing is more easily hurried by bodily motion, and the pulse becomes more frequent, particularly after meals and towards evening. Towards evening there is also frequently experienced a slight degree of chilliness, followed by heat and nocturnal perspirations. This is commonly called night sweats. The patient becomes languid and indolent, and gradually loses strength. After a time the cough becomes more frequent, and is particularly troublesome during the night, accompanied by an expectoration of a clear, frothy substance, which afterwards becomes more copious, viscid, and opaque, and is most abundant in the morning; the *sputum* is often tinged with blood; or hemoptysis occurs in a more marked form, and to a greater extent. As the disease advances, the breathing and pulse become more hurried; the fever is greater, and the perspirations more regular and profuse. The emaciation and weakness go on increasing; pain is felt in some part of the thorax, which is increased by coughing, and sometimes becomes so acute as to prevent the patient from lying on the affected side. All the symptoms increase toward evening: the face is flushed; the palms of the hands and soles of the feet are affected with a burning heat; the feet and ankles begin to swell, and, in the last stage of consumption, there is nearly always profuse diarrhœa. The emaciation is extreme; the countenance assumes a cadaverous appearance, the cheekbones are prominent, the eyes hollow and languid. "The emanation, pallor, and weakness become extreme." Failing circulation, toward the end, is indicated by more or less puffiness about the ankles. "The mind remains clear and hopeful to the last."

Sea voyages, and residence at the seaside, are generally found to be very beneficial; and, as a general rule, those places that are least subject to variations of temperature are recommended. The practice, however, of sending patients in the last stage of consumption away from home—to California, Florida, or elsewhere—cannot be too strongly reprobated. No one should be allowed to sleep with a consumptive patient after the disease has fully manifested itself. The contagious principle is found not in the breath, but in the sputum which is raised from the lungs; this should be destroyed.

The acute variety runs a rapid course, terminating fatally in a few months. Sub-acute and chronic types, under careful treatment and

the proper hygienic surroundings, may be arrested, and the patient restored to a state of health; and, even where this is not the case, the progress of the disease will at least be retarded. Tonic medicines, such as bark, sarsaparilla, iron, and iodine, are also very beneficial in the treatment of phthisis; at least in those cases where inflammation or much febrile excitement does not exist. The treatment comprises a proper attention to the digestive organs, with wholesome diet, exercise in the open air, regular habits, attention to the skin, and, if necessary, change of air. The diet should be nutritious, but not stimulating, and the exercise not violent nor too prolonged.

When the stomach symptoms are so severe that they interfere with the patient's nutrition, the following is often beneficial:—

Fowler's Solution of Arsenic,.....1 dram.
Tincture of Nux Vomica,.....2 drams.
Chloroform Water,.....to make 4 ounces.

Mix. Give one teaspoonful in a wineglass of water before meals.

Sometimes it may be necessary to use a sedative mixture such as:—

Bismuth Subnitrate,.....160 grains.
Dilute Hydrocyanic Acid,.....32 drops.
Cinnamon Water,.....enough to make 2 ounces.

Mix. Give one teaspoonful every two hours until vomiting or nausea ceases.

Constipation is relieved by attention to the diet and administration of fruit or fruit juices, by soap and water or olive oil injections, avoiding so far as possible the use of cathartics.

Diarrhœa commonly subsides by a strict regulation of the diet, and the avoidance of all stimulating food and medicine; otherwise, small doses of chalk and opium, or rhubarb and opium, may be administered. When the pulse is very frequent and the palpitation distressing, digitalis may be used.

But little can be done for the reducing of fever. The patient while feverish should be in bed or on a couch and given a sponge bath with tepid water and alcohol, and in addition either of the following combinations used to reduce the temperature:—

Antipyrine,.....1 dram.
Syrup of Orange,.....1 ounce.
Water,.....to make 3 ounces.

Mix. Give two teaspoonfuls three times daily when required.

Or a capsule containing:—

Sulphate of Quinine,.....5 grains.
Dover's Powder,.....1½ grains.

May be given from three to five hours before the expected rise of temperature.

For night sweats:—

Peruvian Balsam,.....15 minims.
Formic Acid,.....1 dram.
Chloral Hydrate,.....75 grains.
Alcohol,.....4 ounces.

Sponge the body with this at bedtime.

And internally:—

Camphoric Acid,.....4 drams.
Sugar of Milk,.....2 drams.

Mix. Divide into sixteen powders. Use one on retiring and another two hours later if needed.

For the cough:—

Dionin,.....⅛ to ¼ grain.
Dilute Hydrocyanic Acid,.....2 drops.
Syrup of Tolu,.....to make 1 dram.

Mix. Administer this every three hours until relieved.

When the cough is excessive and there is but little secretion the following will be found efficient:—

Terebene,.....80 drops.
Spirits of Chloroform,.....160 drops.
Dilute Hydrocyanic Acid,.....20 drops.
Syrup of Acacia,.....to make 2 ounces.

Mix. Give one teaspoonful in a little water every three hours.

For hemorrhages from the lungs (Hemoptysis):—

Stypticin,.....8 grains.
Peppermint Water,.....1 ounce.

Mix. Give one teaspoonful every hour until relieved and apply an ice bag to the chest.

As so much depends in the treatment of consumption upon the full assimilation of as large quantities of good nourishing food as possible, any digestive disturbances are to receive immediate attention. These are sometimes brought about by drugs given to relieve other conditions. In this event the use of such offending medicines is to be discontinued. The general principles of treatment for dyspepsia will then obtain. (See "Modern Methods of Treating and Curing Consumption," page 165.)

DISEASES OF THE HEART.

DILATATION OF THE HEART.

Increase in size due to the enlargement of one or more of the cavities of the heart.

Causes.—Chronic disease of the valves of the heart; effusion of fluids; chronic bronchitis; Bright's disease; alcoholism; and syphilis. Over-exertion frequently causes it in delicate persons.

Symptoms.—Poor circulation; feeble pulse; headache, increased by standing or sitting upright; fainting; cough; difficulty in breathing; dizziness; bleeding at the nose; dyspepsia; constipation; dropsy; and mental dullness.

Prognosis.—This is unfavorable. Death results either suddenly from paralysis of the heart caused by over-excitement, or gradually from exhaustion.

Treatment.—The disease is incurable and all that can be done is to afford relief. The first point to attend to is the nourishment of the patient by generous diet, moderate exercise, and the making of good blood by the use of red wines, iron preparations, etc. A very rigid hygiene must be observed. Heart tonics, such as digitalis, may be administered in some such form as:—

Tincture of Nux Vomica,.....½ ounce.
Tincture of Digitalis,.....½ ounce.

Take fifteen drops in water after each meal.

Or:—

Tincture of Digitalis,.....1½ drams.
Tincture of Cereus Grandifloris,.....1 ounce.
Citrate of Caffeine,.....1 dram.
Compound Tincture of Cardamom, to make 4 ounces.

Take a teaspoonful in water three or four times a day.

During the intervals of attacks, rest, diet, and the removal of exciting causes are to be attended to. Great care must be taken that there is no constipation or the formation of gas in the stomach. Tonics such as arsenic, iron, strychnine, etc., are of value. They are used to fortify the system against later attacks. Cold baths must not be given under any circumstances during this condition.

INFLAMMATION OF THE PERICARDIUM OR PERICARDITIS.

Inflammation of the membrane which envelops the heart.

Causes.—That form which results directly from cold and exposure is seldom seen, for it is most frequently of secondary nature and origin. It either follows or is connected with rheumatism, scarlet fever, influenza, smallpox, tuberculosis, blood poisoning, Bright's disease, diabetes, and pneumonia of alcoholics.

Symptoms.—Chills; remittent fever, sometimes nausea and vomiting; distress and tenderness over the heart; sharp, shooting pains; dry, suppressed cough which increases the pain; and often severe palpitation. After a few days there is effusion of liquid with oppression around the heart much increased; fainting; extreme difficulty in breathing, so that the patient cannot lie down; vomiting; and, sometimes, delirium.

Prognosis.—Usually favorable; but when pus is present in effusion the termination is usually fatal. Relapses are to be guarded against.

Treatment.—Rest; mental quiet; milk diet; dry cups applied to the region of the heart; poultices; blisters; or cold applications, ice bags, etc., are often preferable. Hypodermic injections of morphine are often needed to allay the severe pain. The following is useful in lessening the inflammation and in relieving stomach and intestine disturbances:—

Calomel,.....$\frac{1}{3}$ grain.
Bicarbonate of Soda,.....2 grains.
Sugar of Milk,.....2 grains.

Make six such powders and take one dry on the tongue every two hours until the bowels move freely.

The liquid diet should be maintained during the period of effusion, and the use of stimulants and tonics should be free.

Inflammation of the heart (*Carditis*) itself sometimes occurs, but it is usually accompanied with inflammation of the pericardium. The symptoms in both cases are the same, and the treatment will, consequently, be similar. In inflammation of the interior lining membrane of the heart (*Endocarditis*) there is more or less of fever and anxiety, and a peculiar sound of the heart may be heard. A disease so dangerous as pericarditis should always have the prompt attention of a physician.

PALPITATION OF THE HEART.

Functional disturbance of the heart marked by increased frequency of its action with lack of rhythm of its movements.

Causes.—Over-exertion, anæmia, exhaustion, puberty, female sex, menstrual disorders, emotion, hysteria, heart-strain, abuse of tea, coffee, tobacco, and alcohol.

Symptoms.—The attack is usually sudden, with some pain in the region of the heart. The beating of the heart is often so violent and rapid as to be visible through the clothing. The breathing is difficult and there is a choking sensation in the throat so that the patient is obliged to sit upright. There are vertigo; faintness; face flushed or pale; anxiety and fear. The attacks last for a few minutes, a few hours, or for a day. After the attack the patient shows a great desire to sleep.

Prognosis.—With early and effective treatment the termination is favorable.

Treatment.—First, endeavor to remove the cause, whatever it may be. Then give:—

Hoffman's Anodyne,.....1 dram.

Give one such dose every three hours.

Or:—

Aromatic Spirits of Ammonia,.....1 dram.

Give one such dose every three hours.

If there is anæmia, the elixir of quinine, iron, and strychnine is beneficial.

IRREGULAR PULSE OR ARHYTHMIA.

A lack of rhythm or of regularity of heart beats, as shown in the pulse. It is a symptom rather than a separate disease.

Causes.—It is caused by affections of the heart and arteries due to neurasthenia (nervous debility), hysteria, dyspepsia, and the abuse of tea, tobacco, and coffee.

Symptoms.—The heart beats are irregular both in point of time and in force. The pulse may skip a beat now and then. There are always attendant symptoms of heart disease, either organic or functional.

Prognosis.—Entirely dependent upon the cause. If the disease is functional, the prognosis is favorable; if organic, unfavorable.

Treatment.—In cases not due to organic heart trouble:—

Bromide of Potash,.....10 to 15 grains.

Take one such dose three times a day.

Or:—

Bromide of Soda,.....10 to 15 grains.

Take one such dose three times a day.

The diet must be well regulated; attention given to the bowels; and complete rest for both body and mind secured.

In other cases bitter tonics and treatment directed to the causal heart trouble. In such cases a physician should be consulted.

RAPID HEART OR TACHYCARDIA.

Rapid heart action as indicated by the pulse.

Causes.—Brain or spinal diseases; change of life; neurasthenia; irregularities of habit; excesses of any kind; chronic heart affections; excessive use of tobacco; high fever; etc.

Symptoms.—The attack may come on suddenly with or without such warnings as dizziness or ringing in the ears. The pulse is increased to 150, 175, 200, or in very rare cases to 250 beats per minute. There is oppression over the heart and sometimes a sensation of smothering. The attack may last from a period of a few minutes to hours and days.

Prognosis.—This is good, when the attack is caused by some removable affection. In cases of organic heart disease, it is sometimes terminated by sudden death.

Treatment.—The patient must rest in bed; ice is to be applied over the heart. To quiet the nervous element of the attack use:—

Bromide of Soda,.....15 grains.

Or:—

Bromide of Potash,.....15 grains.

Take of either of these one such dose every four hours.

Attention must be paid to the diet during the intervals between attacks. The food must be nourishing; and bitter tonics may be given.

Fowler's Solution of Arsenic,.....1 dram.
Strychnia Sulphate,.....½ to 1 grain.
Bitter Wine of Iron,.....enough to make 4 ounces.

Take one teaspoonful in a wineglass of water after each meal.

SLOW HEART OR BRACHYCARDIA.

Either a sudden or permanent slowness of the heart action as indicated by the pulse.

Causes.—It is present in some nervous diseases, fatty degeneration of the heart, and in the hardening of some of the muscles which supply the heart. Also in convalescence from diphtheria, pneumonia, typhoid fever, rheumatism, and erysipelas. It is found in epileptics, drunkards, anæmic persons, and in cases of lead poisoning.

Symptoms.—The pulse beats from 40 down as low as 8 beats per minute. It is weak, low, and small. There are dizziness; disturbance of the hearing; and fainting. Sometimes convulsions attend the attack. There may or may not be warning signs of its approach.

Prognosis.—Like all heart cases, this depends upon the cause. When organic heart disease is the cause, death sometimes suddenly terminates the case.

Treatment.—If the heart is beating fast enough to supply the needs of the body, no treatment is needed. If not, rest in bed; hot applications of mustard over the region of the heart; and the employment of heart tonics. In cases of emergency these latter must be administered by hypodermic injection. Between attacks, nutritious diet and bitter tonics to improve the general condition of the patient must be used.

NEURALGIA OF THE HEART OR ANGINA PECTORIS.

Severe paroxysms of sharp pains in the region of the heart.

Causes.—Lack of nutrition of the heart, either by diseased conditions or obstructions of the arteries which supply it; pressure of a tumor; very great dilatation or enlargement of the heart; great excess in the use of tobacco and narcotics; or disease of the valves. It is also present through heredity, syphilis, epilepsy; and the attacks are often precipitated by over-exertion, mental excitement, or acute indigestion.

Symptoms.—Excruciating pains around the heart, up to the neck, and down the left arm; difficulty in breathing; feeling of oppression over the heart; weak heart action; pale face; fear of death; perspiration in large drops over the body; cold sweat; extreme prostration. The attack lasts only a few seconds or minutes. It is usually followed by excessive flow of urine or by vomiting. It is very liable to recur for years.

Prognosis.—Recovery from the first attack occurs in 75 per cent. of cases; but death usually ensues in later attacks.

Treatment.—As the attack is of such short duration, prompt treatment is required to relieve the intense pain. If a physician is at hand he will do this by hypodermic injections of morphine, atropine, or nitro-glycerine. The inhalation of chloroform or of amyl nitrite is also beneficial.

Or:—

Chlorodyne,.....10 to 15 minims.

This dose repeated at intervals will afford relief.

Hot mustard plaster or similar form of counter-irritation over the region of the heart is also useful.

ENLARGEMENT OF THE VENTRICLES OF THE HEART.

This is the result of overaction causing an excess of nutrition, the nutritive process appearing to go on more rapidly on account of the extra work which the heart is called upon to perform. In this way the heart is often greatly enlarged in bulk, and its operations seriously interfered with. Three kinds are classified: first, simple, when the walls of the heart or its divisions are thickened, without any diminution in the capacity of the cavities; second, eccentric, or aneurismal, when the walls are thickened, and the cavities likewise enlarged; and, third, concentric, when the cavities are diminished in proportion to the thickening of the walls. The second of these is the most frequent; and any of them may affect a single cavity or the whole heart. The pulsations are frequently regular, but strong, sometimes even visibly raising the bedclothes, and the chest is bulged out over the part.

Treatment.—Rest and freedom from exertions and emotions are proper means to be employed in such a case; and usually, with care and

perseverance, the symptoms will be much alleviated. Stimulants must be avoided; coffee and tobacco are usually detrimental in such cases.

SHRINKING OR ATROPHY OF THE HEART.

A wasting of the heart's substance, arising from a deficiency in the supply of blood (nutrition). It is usually accompanied by general emaciation, and terminates in death. When the heart is examined after death, the tissues are found to have undergone a change. This is called "fatty degeneration." The treatment is to strengthen the system by tonics, especially iron and nux vomica, wholesome and nutritious diet, open air, exercise, sea bathing, etc.

FAINTING OR SYNCOPE.

This is a state of total or partial unconsciousness, occasioned by diminished action of the heart, causing less rapid circulation of blood through the brain.

Causes.—The causes of it are various, and sometimes very peculiar, such as a particular smell; that of a rose, for instance, has been known to occasion it; certain objects presented to the sight; surprise, joy, fear, or any sudden emotion; loss of blood, or anything which tends to debilitate.

Symptoms.—The first sensation of fainting is generally a singing in the ears; then the sight becomes confused, and all the senses deadened; a clammy sweat breaks out over the body, the countenance becomes deadly pale, and the limbs refuse to support the weight of the body, and the sufferer sinks to the earth helpless and motionless.

Treatment.—Place the patient in a horizontal position; free the face, neck, and upper part of the chest from all tight clothing; let the fresh air play freely upon them, and sprinkle the face with cold water, holding to the nostrils from time to time some volatile stimulant, such as hartshorn or ammonia. As soon as swallowing can be accomplished, administer about thirty drops of spirit of wine, or sal volatile, in water. The after-treatment will of course depend on the cause.

Persons subject to fainting should be careful in frequenting crowded rooms, or going anywhere where the air is bad. Tight dresses should be avoided; and no excitement be allowed. A well regulated diet,

cold bathing, and vegetable tonics will usually cure this distressing infirmity.

DISEASES OF THE STOMACH.

INFLAMMATION OF THE STOMACH OR ACUTE GASTRITIS.

Inflammation of the mucous membrane of the stomach.

Causes.—The corrosive poisons such as the mineral acids, corrosive sublimate, carbolic acid, copper, etc.; indigestible food in the stomach; alcohol in excess or irritating medicines; exposure to cold, wet, and fevers.

Symptoms.—Loss of appetite; coated tongue; bad breath; vomiting; fever; headache; burning sensation in the palms of the hands and the soles of the feet; pain and tenderness over the stomach; constipation or diarrhœa.

When the result of poisons there are nausea; vomiting; cold, clammy skin; slight perspiration; low, weak pulse; intense heat and burning in the stomach; thirst; purging; and collapse.

Prognosis.—In non-poisonous cases or a mild type the attack lasts about a week and usually terminates favorably. In poisoning cases the patient often dies from shock or exhaustion and not infrequently from starvation. Those who do recover are generally always troubled with gastric affections.

Treatment.—When due to poisoning a physician should be called without delay and the stomach washed out and the proper antidote administered. (See Poisons and their Antidotes, page 611.) Ice internally and externally will afford relief. Milk and lime water should be administered after the stomach has been thoroughly emptied and other nutriment given by the rectum.

Cases due to other causes are best relieved by emptying the stomach with an emetic followed after action by a brisk cathartic such as Epsom salts, Hunyadi water, or Apenta water, and the application of hot bran poultices, sprinkled with laudanum, to the seat of pain. After which the diet should be carefully selected—liquid diet at first, gradually increased until the regular diet is resumed. The use of bitter tonics such as: tincture of nux vomica, five to ten drops, and Fairchild's

essence of pepsin, one teaspoonful in a wineglass of water before each meal.

Or:—

Bicarbonate of Soda,.....3 drams.
Subnitrate of Bismuth,.....2 drams.
Chloroform Water,.....3 ounces.

Mix and add:—

Peppermint Water,.....1 ounce.
Cherry-laurel Water,.....2 ounces.

Take a tablespoonful four times a day.

MILK SICKNESS.

Causes.—A disease chiefly confined to the West, where the cattle roam at large in the woods or over prairies, and eat food which poisons the milk.

Symptoms.—Sickness at the stomach, weakness and trembling of the legs. There is vomiting and a peculiarly offensive breath. These symptoms continue for weeks, and are often all that are shown in this complaint; but in some severer cases there are chills and flashes of heat, great oppression about the heart, anxiety, deep breathing, heat in the stomach, violent retching and vomiting, alarming heart action, and throbbing of the large vessels, and cold extremities. In most cases, the vomiting returns every hour or two, attended by a great burning at the pit of the stomach, the substance thrown up having a peculiar bluish-green color and a sour smell. As soon as this discharge takes place, the patient falls back upon the pillow, and lies easy until another paroxysm occurs. The tongue is covered with a whitish coat, and the bowels are obstinately costive. The pulse is weak and rapid.

Treatment.—The treatment cannot vary much from that pursued for inflammation of the stomach. Some cathartic to move the bowels should be given.

WATER BRASH.

Water brash consists in a discharge from the stomach, generally in the morning, of a thin fluid, sometimes insipid. A burning heat or pain of the stomach attends it, and seems to cause the discharge. The amount thrown up varies from a spoonful to a pint.

Cause.—It is due to acid indigestion.

Treatment.—Ten or fifteen drops of ammonia water in half a tumblerful of cold water will quiet the distress and stop the discharge. The best remedy for this discharge is the subnitrate of bismuth, taken at meal times, three times a day, in 30-grain doses. The tincture of nux vomica in 5-drop doses is good. The blood should be improved by tonics containing iron, and the food should be nourishing and digestible.

NAUSEA AND VOMITING.

A sensation of sickness associated with vomiting.

Causes.—Although the feeling of nausea itself is referred to the stomach, and may be due to causes connected with that organ, it may arise from various causes, as excess in eating and drinking, and foulness or weakness of the stomach. It also frequently originates in disorder in other and distant parts of the body.

Treatment.—Calomel, one half to one fourth grain, and bicarbonate of soda, two grains, every two hours for eight or ten doses. Three hours after the last dose take a purgative dose of Hunyadi water.

After the bowels have been thoroughly moved, the use of pepsin, bismuth, and strychnia is in order.

When the nausea and vomiting are so persistent that these remedies cannot be retained their administration may be preceded by the following:—

Carbolic Acid,.....4 grains.
Bismuth Subnitrate,.....2 drams.
Glycerine,.....3 drams.
Peppermint Water,.....to make 3 ounces.

Mix. Give one tablespoonful every two hours until relieved.

Or:—

Bismuth Subnitrate,.....160 grains.
Dilute Hydrocyanic Acid,.....30 drops.
Cinnamon Water,.....2 ounces.

Mix. Give one teaspoonful every two hours.

The nausea and vomiting of drunkards is relieved by:—

Strychnia Nitrate,.....¼ grain.
Fowler's Solution of Arsenic,.....20 drops.
Glycerine,.....3 drams.
Water,.....to make 2 ounces.

Mix. Give one teaspoonful every four hours.

CRAMP OR SPASM OF THE STOMACH OR GASTRALGIA.

Violent paroxysms of pain in the stomach.

Causes.—A form of neuralgia of the stomach; a result of neurasthenia; gastric cancer, or ulcer; malaria; anæmia; syphilis; indiscretions of diet; worry; menstrual disorders; excessive use of tobacco.

Symptoms.—Sudden, severe, griping pains in the stomach; faintness; shrinking of the countenance; intermittent pulse; cold hands and feet. The pain is often so severe as to cause outcries from the patient. Some relief is felt from pressure on the stomach. The pain usually subsides in half an hour. Exhaustion follows the attack. When the pain suddenly subsides there are often vomiting or eructions of gas or thin fluid like water, mild perspiration and flow of reddish urine. The pain is relieved by taking food.

Prognosis.—Not dangerous but may be persistent.

Treatment.—The paroxysm is relieved by:—

Chlorydine,.....20 to 30 drops.

Repeat in one hour if necessary.

If the attack is mild give:—

Antipyrine,.....10 grains.

and apply a hot water bag over the stomach.

Or:—

Spirit of Chloroform,.....1 dram.
Compound Spirit of Lavender,.....1 dram.

This is useful to dispel gas and relieve distention of the stomach.

During the intervals the cause is to be combated. For nervous causes, rest, freedom from worry, outdoor exercise, and care that no irritating food is taken.

DYSPEPSIA OR INDIGESTION.

This is one of the most common ailments to which mankind is subject.

Causes.—Accidental fits of indigestion are of frequent occurrence, and are caused by overloading the stomach with food, and indulging freely in wines, spirits, or other intoxicating liquors. Confirmed or chronic indigestion may depend on debility or want of tone of the

stomach, or it may be caused by the lining or mucous membrane of this organ being in a state of irritation, or chronic inflammation. One of the most frequent causes of indigestion is improper mastication of the food; such food is bolted, instead of being reduced to a pulp, thereby presenting to the digestive organs a hardened mass, difficult to digest. Another cause is habitual inattention to diet, both with regard to the quality and quantity of food, irregular meals, drinking large quantities of warm, relaxing fluids, and using malt liquors too freely. A third cause is insufficient exercise; a fourth cause, impure air; and, beside these, there are numberless other causes, which in a greater or less degree exercise their baneful influence upon the stomach.

Symptoms.—One of the most frequent signs of indigestion is loss of appetite, perhaps even an absolute repugnance and disgust at the very thought of eating. Sometimes the appetite is capricious and uncertain, or it may be ravenous. Sometimes nausea comes on immediately after the food is swallowed; and sometimes, without any nausea, the food is ejected by vomiting. There is usually an obscure feeling of uneasiness, fullness, distention, and weight in the region of the stomach, occasionally amounting to pain, or even severe pain, with flatulence and eructation. Some persons suffer pain when the stomach is empty, others immediately after taking food, or the pain may not begin for two or three hours after a meal, and then continue for some hours. Sometimes the pain comes on at uncertain intervals accompanied by a sensation of distention, much anxiety, and extreme restlessness. Costiveness is a very frequent concomitant of dyspepsia, but sometimes it is attended by diarrhœa.

Among the innumerable disorders that are produced by dyspepsia are palpitation of the heart, irregularities of the pulse, asthma, pain in the head, with the loss of mental energy, and some confusion of thought. One of the worst of the occasional concomitants of dyspepsia is that state of mind which is known as hypochondriasis. There is languor, listlessness or want of resolution, with an apprehension of some great evil in the future. Such persons are particularly attentive to the state of their own health, and, from any unusual feeling, perhaps of the slightest kind, they apprehend great danger, or even death itself.

Kinds of Dyspepsia.

I. Irritative Dyspepsia, as the name implies, is caused by one or more of the many possibilities of irritation of stomach resulting from

coarse, unchanged diet, or alcoholic excesses. One of the most marked symptoms is vomiting; and the tongue is pointed, small, and red.

II. Acid Dyspepsia, marked by water brash, sour stomach, with the acidity extending to the intestines and the urine.

III. Flatulent Dyspepsia, accompanied by very great development of gas in the abdomen, dizziness, worry, and hypochondriasis.

IV. Nervous Dyspepsia is the common form seen among business and professional men. It is caused largely by rapid eating and sedentary life. The symptoms are sleepiness after eating; dizziness; sleepless nights; loss of memory; headache; and general nervousness.

Prognosis.—The outlook is favorable provided proper treatment and good hygiene are observed. Otherwise the duration may be indefinite.

Treatment.—Before we proceed to give the remedies applicable to this disorder, we lay before our readers what is of equal consequence, both as regards prevention and cure—viz., diet and regimen. Rise early; sponge the body freely with cold water; eat a slice or two of stale bread, together with a piece of broiled beefsteak cooked rare, for breakfast. After a short rest, exercise should be taken for two hours or upwards. The dinner hour should not be earlier than four or five hours after breakfast, and the best time in the day for this meal is the noon hour. The food should be taken plain without sauces. Roast beef or mutton are the best of all meats, both as regards nourishing properties, and the ease with which they are digested. Avoid coffee; buttermilk or koumyss may be used instead. Bitter tonics may be used, and a pepsin powder after each meal. After dinner, rest and quiet for an hour are desirable. About four or five hours after dinner a cup of tea with stale bread and good butter, with fresh or preserved fruit, may be eaten sparingly. Retire early. This mode of living will generally render a person exempt from habitual indigestion; nevertheless, in spite of these precautions, occasional attacks of this derangement will make themselves felt.

Starchy, sweet, and fat food must be avoided. The food must be well chewed, and only small quantities taken at a time. Liquids should be taken in only very small quantities and alcoholic stimulants should not be taken in any quantities.

As a medicinal help to digestion, taka-diastase taken in 2 to 4 grain doses after meals is very beneficial.

Or:—

Pepsin,.....1 dram.
Dilute Hydrochloric Acid,.....4 drams.
Glycerine,.....4 drams.
Cherry-laurel Water,.....2 ounces.

Take one teaspoonful in water before each meal.

Flatulency, wind on the stomach, may be relieved by the use of purified animal charcoal in the form of tablets. One allowed to dissolve in the mouth occasionally.

Heartburn and the burning sensation in the stomach are benefited by:—

Subnitrate of Bismuth,.....20 grains.
Aromatic Powder,.....5 grains.

One such dose as required.

Vomiting is present in Irritative Dyspepsia. (See "Nausea and Vomiting," page 364.)

Great benefit is felt from drinking from a half to one pint of hot water an hour before each meal. This has the effect of washing or irrigating the stomach and exciting it to healthy action.

Constipation is frequently a troublesome and dangerous attendant. (See "Constipation," page 370.)

GASTRIC ULCER OR ULCER OF THE STOMACH.

The cause of this condition is not quite settled. It attacks young women more frequently than men. Those who are anæmic, overworked, and underfed, and those who have suffered injury in the region of the stomach are most susceptible to this disease.

Symptoms.—Disturbances of digestion associated with pain at the pit of the stomach. This pain is of a burning, boring, or gnawing character, increased by taking food, and may be felt at once after eating, or an hour or two after the meal.

Pain is frequently felt in the back. Vomiting of blood is quite constant. The patient may be emaciated, or appear well nourished. Blood is sometimes found in the stools. The disease is of a chronic character and frequently leads to perforation of the stomach wall.

Prognosis.—The patient may recover under favorable treatment; but the greatest danger arises from perforation of the bowel, which requires prompt surgical attention.

Treatment.—Rest in bed should be enforced. Feeding should be

conducted through the rectum to give the stomach a complete rest, or the patient should partake by the mouth of only skimmed milk, two ounces, and limewater, one ounce, every two hours. The pain is relieved by use of anodynes. The hemorrhages are controlled by the administration of acetate of lead, one or two grains twice daily, or a capsule containing one or two grains of stypticin three times daily.

Silver nitrate, one fourth grain every four hours, has a beneficial effect upon the ulcer, but it is useless here to further describe the treatment, which can be carried out only under the intelligent guidance of a physician.

GASTRIC CANCER OR CANCER OF THE STOMACH.

This condition occurs more commonly in men after the fortieth year.

Causes.—Heredity; gastric ulcer; and alcoholism. Scientists now believe it to be due to a cancer germ.

Symptoms.—It develops slowly, with gradual loss of strength, indigestion, fermentation, dyspepsia, and foul breath. There is vomiting, after meals, of partially digested food and blood which is more or less altered, giving the vomit a black or coffee ground appearance. A new growth may be felt over the region of the stomach, at which point there is much tenderness amounting to pain which is dull, heavy, and increased by pressure (even by the weight of the clothing) and after eating.

The patient is emaciated, has some fever, the bowels are constipated and, because of the presence of blood, the stools are black and tar-like. Dropsy of the lower extremities, particularly of the ankles, is present.

Prognosis.—The disease terminates usually within a year after its recognition. The patient is melancholy, but the mind is clear to the end. Medical treatment is of little avail. Surgical intervention frequently prolongs life.

Treatment.—This is palliative and is directed towards sustaining the strength of the patient and allaying pain. The food must be predigested. The best form is peptonized milk. This is conveniently prepared by adding five grains of the extract of pancreas and fifteen grains of bicarbonate of soda to one pint of milk. The mixture is

then placed in a vessel of water and kept at a temperature of about 100° or 115° Fahrenheit for one hour. Beef, eggs, and similar food may be peptonized. (See "Food for the Sick," page 281.)

In cases where the stomach is not able to retain food, rectal feeding must be resorted to. (See "Nursing," page 235.)

Digestion is improved and fermentation of the food in the stomach is prevented by:—

Sulphate of Strychnia,.....½ grain.
Dilute Hydrochloric Acid,.....4 drams.
Infusion of Gentian,.....to make 5 ounces.

A tablespoonful in water before each meal.

Bad breath may be relieved by charcoal tablets, or by from ¼ to ⅓ of a grain of carbolic acid in water.

No stimulants should be used.

DISEASES OF THE BOWELS.

CONSTIPATION.

When there is an undue retention of the contents of the bowels, their contents become hard and are expelled with difficulty and sometimes with pain.

Causes.—Neglect of the usual time of going to stool, extraordinary heat of the body, copious sweats, taking food that is dry, heating, and difficult of digestion; sedentary life, or a diseased state of the liver or spleen, sometimes from stricture in the rectum.

Treatment.—The first thing to be done is to establish the habit of trying to evacuate the bowels every day at a certain hour; the best time for most people is just after breakfast. It matters not if the bowels do not act; the practice of attempting should be persisted in, and in time it will break up the confined state of the bowels. Adopt a diet free from all astringents, taking care especially that there is no alum in the bread. Let the food consist of a due admixture of meat and vegetables for dinner; the beverage, water. For breakfast stale bread or dry toast, with a moderate quantity of butter, honey, fish, or bacon; cocoa is, perhaps, preferable to tea or coffee; porridge made of Scotch oatmeal. Regular exercise, either walking or horseback riding, should be taken. Apples, pears, stewed prunes, raisins, gruel with

currants, broths with spinach, leeks, and other soft pot-herbs are excellent laxatives. If the above mode of living fail to relax the bowels, inject a warm water enema.

Hunyadi Janos water is a very beneficial aperient.

Or:—

Bicarbonate of Soda,.....2 drams.
Tincture of Nux Vomica,.....4 drams.
Tincture of Capsicum,.....1 dram.
Tincture of Rhubarb,.....1½ ounces.
Compound Infusion of Gentian,...to make 6 ounces.

Take a half-tablespoonful in water after each meal.

Or:—

Fluid Extract of Cascara Sagrada,.....1 ounce.
Tincture of Nux Vomica,.....½ ounce.
Syrup of Ginger,.....½ ounce.
Infusion of Sarsaparilla,.....to make 3 ounces.

Take a teaspoonful in water three times a day.

For beneficial mineral and aperient waters, see Hydrotherapy.

INTESTINAL INDIGESTION.

Defective and imperfect digestion of food after it has passed from the stomach.

Causes.—Imperfect diet; overeating; worry; mental weariness; abuse of tobacco and stimulants; irregular hours; sedentary occupation; diseases of the stomach, liver, or intestines; malaria; deficiency of intestinal secretions; or loss of tone of the intestines.

Symptoms.—Abdominal pain; distention of the abdomen; both occurring some hours after meals (these symptoms are delayed much longer after eating than are similar signs of stomach indigestion); emaciation; anæmia; nervousness; flatulency; coated tongue; loss of appetite; diarrhœa; and headache. Sometimes the liver is involved, then there are jaundice, dark-colored urine, and light-colored, clayey stools. In chronic cases the pain is first felt in from two to six hours after eating; difficulty of breathing; constipation; and dry, harsh skin are manifested.

Treatment.—The pain is to be relieved by hot applications and a cathartic to expel the irritating matter.

Calomel,.....$\frac{1}{3}$ grain.
Bicarbonate of Soda,.....2 grains.
Powdered Ipecac,.....1-6 grain.
Sugar of Milk,.....3 grains.

Make six such powders and take one every two hours.

This is to be followed by a full dose of Epsom salts, Rochelle salts, Hunyadi Janos water, or Apenta water.

The intestines are then stimulated by:—

Tincture of Nux Vomica,.....2 drams.
Dilute Hydrochloric Acid,.....4 drams.
Compound Tincture of Cardamom,.....4 drams.
Essence of Pepsin,.....to make 3 ounces.
A teaspoonful every three hours in water.

Or, in more severe cases, give:—

Phosphate of Soda,.....1 ounce.
Dilute Phosphoric Acid,.....4 drams.
Syrup of Lemon,.....1 ounce.
Chloroform Water,.....3 ounces.
Peppermint Water,.....3½ ounces.

Take a tablespoonful in a wineglass of water after each meal.

In chronic cases much benefit is derived from aperient waters.

See Hydrotherapy.

The following pill often produces excellent results in chronic cases:—

Arsenate of Soda.....1-20 grain.
Sulphate of Strychnia,.....1-32 grain.
Pure Pepsin,.....2 grains.

Take one such pill after each meal.

The diet must be restricted to easily digested food, such as milk, eggs, and beef.

DIARRHOEA.

Causes.—The causes which produce diarrhœa are indigestible food, or food taken in too great quantities; acid fruits, irritating substances taken into the stomach; the abuse of active purgative medicines; the application of cold to the body; and the suppression of perspiration.

Symptoms.—This disease consists in a copious and frequent discharge of matter from the bowels, accompanied by griping. There is a sense of weight and fullness in the lower part of the stomach, attended with a murmuring noise, arising from the presence of a great

collection of wind. This feeling is relieved after every evacuation which takes place and is renewed before a second ensues. In addition to these symptoms, the patient is troubled with nausea, vomiting, and, if the purging be not quickly arrested, by great exhaustion and depression of the vital powers, accompanied by more or less colicky pain. It is distinguished from dysentery by the absence of blood in the motions. The appearance of the stools in the commencement of the disease is sometimes thinner than natural, in consequence of a large quantity of fluid being poured out by the intestines. They are sometimes slimy and of a green color; sometimes they are yellow, and sometimes of a dark brown, accompanied by a very fetid smell. As the disease advances they become very watery, and similar to coffee grounds; the strength rapidly fails, the countenance turns pale, the skin is dry and stiff, great emaciation takes place, and dropsy frequently ensues.

Treatment.—In the treatment of this disease, attention must be paid to the cause which produces it, and the remedies administered accordingly. If it is caused by indigestible food, or should the stools be scanty and frequent, and accompanied by some degree of bearing down, four or six drams of castor oil, with five drops of tincture of opium, will afford great relief. If it is caused by the abuse of purgative medicines, they must be discontinued, and the following mixture administered:—

Tincture of Rhubarb,.....1 ounce.
Tincture of Opium,.....30 drops.
Spirit of Lavender,.....4 drams.
Cinnamon Water,.....5 ounces.

Make a mixture, and take two tablespoonfuls every four or six hours.

If it has proceeded from the application of cold to the surface of the body, or the suppression of perspiration, every effort must be made to restore the secretion by the administration of ten grains of Dover's powder, taken in a little gruel or water.

The following is a good mixture:—

Prepared Chalk,.....3 drams.
Spirit of Lavender,.....2 drams.
Compound Tincture of Cardamom,.....2 drams.
Tincture of Opium,.....½ dram.
Cinnamon Water,.....6 ounces.

Make a mixture, and take two tablespoonfuls every three or four hours until the diarrhœa ceases.

Another line of treatment for all forms of diarrhœa is to free the bowels from offending matter by a full dose of castor oil; then take, every three hours, a pill containing:—

Extract of Opium,.....¼ grain.
Camphor,.....3 grains.

Or:—

Insert a 1-grain opium suppository into the rectum once, twice, or thrice, daily.

When it arises from ulceration of the intestines, as often happens in consumption and other protracted diseases, the most effectual astringents, in addition to those already recommended, should be employed, such as catechu, kino, alum, logwood, and tannin. The following is a good mixture in these cases:—

Chalk Mixture,.....5 ounces.
Tincture of Catechu,.....4 drams.
Tincture of Kino,.....3 drams.
Syrup of Poppies,.....2 drams.
Tincture of Opium,.....30 drops.

Make a mixture, and take two tablespoonfuls three or four times a day.

The diet in these cases should consist of sago, arrowroot, and rice puddings, made with or without milk. It will be necessary for those persons who are subject to frequent attacks of this complaint, either from a peculiar weakness or irritability of the bowels, to live temperately and abstain from unwholesome food.

Eclectic Treatment for Diarrhoea.

If caused by cold or obstructed perspiration, keep the patient warm; drink freely of astringent herb teas; use the tepid bath, and wear flannel next the skin. A little snakeroot tea will also be found useful. If there is much griping, a hot fomentation of garden mint should be applied to the stomach. Speedy relief has been effected by taking twelve drops of laudanum in half a gill of the best brandy. Repeat, if necessary, in about an hour.

In obstinate cases, the jelly of slippery elm and blackberry, in equal parts, mixed with a little powdered ginger or cinnamon may be used. For chronic looseness, the following decoction is very good:—

Bistort Root, bruised,.....3 ounces.
Water,.....1 quart.

Boil twenty minutes; then add:—

Cloves, bruised,.....1 ounce.
Cranesbill and Wild Mint, of each,.....½ ounce.
Catechu,.....2 drams.

Boil ten minutes longer, strain, add:—

Loaf Sugar,.....1 pound.

Dose, three tablespoonfuls three or four times a day.

The following has also been used with excellent results: Take equal parts of tincture of rhubarb, spirits of camphor, essence of peppermint, and laudanum. Dose, for an adult, one teaspoonful every hour if necessary; less according to age of the patient and severity of the disease.

DYSENTERY.

A disease accompanied by frequent and scanty discharges from the bowels, and tenesmus or great bearing down of the rectum. The stools are mucous, bloody, or slimy, and contain little or no fecal matter.

Causes.—The causes which produce this disease are a cold and moist state of the atmosphere, quickly succeeded by heat; the suppression of the perspiration, whereby the blood is thrown from the external upon the internal vessels; immoderate use of spirituous liquors, unwholesome food, exposure to noxious exhalations, or to the effluvia arising from the bodies of persons laboring under the disease.

It frequently appears in hospitals which are not properly ventilated, and other places where a number of sick persons are crowded together; while in situations where great attention is paid to ventilation and cleanliness, it seldom extends beyond the individual in whom it originates.

Symptoms.—This disease is ushered in by all the concomitants of inflammatory fever—such as cold shivering succeeded by heat of skin, frequency of pulse, loss of appetite, nausea, and diarrhœa. This stage is quickly followed by severe griping pains, and pain in the abdomen, frequent desire to go to stool, accompanied by straining and painful bearing down of the rectum—the evacuations consist of more or less fecal matter. The stools frequently vary in appearance, being sometimes pure mucus, or mucus streaked with blood and containing pus,

and it not unfrequently happens that pieces of membrane, arising from ulceration of the lining of the intestines, are seen floating in the dejections. The stools number from 5 to 20 or more in 24 hours.

Treatment.—Confinement to bed, the patient using a bedpan; the stools thoroughly disinfected with chloride of lime. The diet must be fluid, non-irritating, and nutritious, such as milk and limewater; white of egg, alone, or with milk and brandy; beef and mutton broths; chicken soup; oyster soup; clam juice.

Castor oil, two to four tablespoonfuls in brandy or whisky; ten to twenty drops of laudanum may be added with great benefit; or Epsom or Rochelle salts in two teaspoonful doses every hour until thorough movement.

The pain and excessive movements may then be controlled by the insertion (into the rectum) of a 1-grain opium suppository every four hours.

Hope's camphor mixture works well in many cases. It is as follows:—

Nitrous Acid,.....1 dram.
Camphor Mixture,.....8 ounces.

Mix and add:—

Tincture of Opium,.....40 minims.

Mix and take one fourth of this mixture every four hours.

The bowels should be washed out with salt solution twice daily: a teaspoonful of table salt dissolved in a pint of hot water.

Chronic cases are benefited by the following:—

Tannalbin,.....1 ounce.
Ichthalbin,.....1 ounce.
Sugar of Milk,.....30 grains.

Mix and divide into thirty powders.

Directions: One three times daily before meals.

When convalescence is established, such reconstructives as cod liver oil, and elixir iron, quinine, and strychnine, in one to two teaspoonful doses after meals, are efficient.

CHOLERA MORBUS.

This is a disease prevalent in hot, damp weather. From the great amount of bile secreted, it is also called Bilious Cholera.

Causes.—Excessive heat, sudden atmospheric changes, wet feet, indigestible food, and unripe fruits.

Symptoms.—This disease begins with sickness and distress at the stomach, succeeded by violent gripings with vomiting of thin, dirty yellowish, whitish, or greenish fluid. The contents of the upper bowels may be vomited. The nausea and distress continue between the vomiting and purging, and the pain at times is intense. The pulse is rapid, soon becoming small and feeble, the tongue dry, the urine high colored, and there is much thirst, though no drink can be retained on the stomach.

Treatment.—Apply a large mustard poultice over the stomach and liver. Give large draughts of warm teas, by which means the stomach will be cleansed of all its solid contents. Warm injections must be given frequently, and hot bricks applied to the feet, while the whole body should be swathed in warm flannels and hot water bottles applied to keep up the body temperature. Hot brandy, in which is a dose of cayenne, is excellent to quiet the vomiting and griping. A few drops of laudanum in the injections may be given, if the pain is excessive.

Or:—

Extract of Opium,.....¼ grain.
Camphor,.....3 grains.

Make into one pill. Give one such pill every three hours for an adult.

Or:—

Morphine Sulphate,.....1 grain.
Quinine Sulphate,.....1 dram.
Aromatic Sulphuric Acid,.....enough to dissolve.
Magnesia Sulphate,.....2 ounces.
Peppermint Water,.....to make 4 ounces.

Shake. Take one to two teaspoonfuls in a glass of water, after stools. This is known as the "Army Hospital Mixture." Diet: Milk and raw eggs. Keep patient in recumbent position.

If these remedies do not afford immediate relief a physician should be summoned without delay.

Eclectic Treatment for Cholera Morbus.

No time must be lost in treating the severe stages of this disease. Give the patient copious drinks of whey, warm barley water, thin water gruel, or weak chicken broth. Bathe the feet and legs in warm saleratus water, and apply warm fomentations of hops and vinegar to the bowels. In addition to these, apply a warm poultice of well stewed garden mint, or a poultice of mustard and strong vinegar will be found

of much service. The vomiting and purging may be stopped by the following:—

Ground Black Pepper,.....1 tablespoonful.
Table Salt,.....1 tablespoonful.
Warm Water,.....½ tumblerful.
Cider Vinegar,.....½ tumblerful.

Dose, a tablespoonful every few minutes. Stir and mix each time until the whole is taken.

Nourishing diet should be taken by the patient. A wineglassful of cold camomile tea, once or twice a day, would be very beneficial, as would ten drops of elixir of vitriol, three or four times a day, or a tea made of black or Virginia snakeroot. Flannel should be worn next the skin, and the warm bath should be frequently resorted to.

COLIC.

Colic is a name given to several varieties of disease characterized by severe pain of the bowels, with distention or flatulence, but without looseness or diarrhœa. Physicians distinguish several varieties of this complaint: Spasmodic, in which the principal symptoms are sharp and spasmodic pains about the navel; that occasioned by indigestible food, gas, or acrid matter in the intestines; bilious, when accompanied by vomiting of bile, or by obstinate costiveness; lead or Devonshire colic, which is due to the poison of lead.

Causes.—Among the most frequent causes may be named worms, poisonous or unwholesome substances, indigestible food, gout, rheumatism, intense cold, acid fruits, and unripe vegetables.

Symptoms.—The symptoms of colic, in general, are distention of the lower region of the belly, with twisting pain, and very commonly vomiting and costiveness.

PAINTERS' COLIC.

Lead or painters' colic is characterized by obstinate costiveness, and vomiting of bile. The pain comes on in paroxysms. The spasms gradually become more violent, and, if not alleviated, become unbearable.

Treatment.—Give immediately from thirty to forty drops of laudanum and apply heat over the abdomen. Hot drinks containing peppermint, spearmint, and composition tea generally afford relief.

For the treatment of paralysis, or palsy arising from the absorption of lead, which is generally confined to the wrists, use galvanism, friction, and shampooing, with chalybeate waters. Those engaged in the manufacture of lead, or in occupations in which one or other of its preparations are frequently handled, may generally escape its baneful effects by strict attention to cleanliness. They should never take their meals where they work, or with unwashed hands. Let them eat fat meat, and butter, and take acidulous drinks, especially those rendered so by sulphuric acid. The men employed at the Birmingham white lead works have been almost free from this disease, to which they were much subject before, since they have mixed a little of the above acid with their molasses beer. From the first attack of lead colic patients generally recover; but unless they change their occupations, or observe the above precautions with scrupulous care, the attacks are repeated, each time with greater violence, and they will become, eventually, miserable cripples.

WIND COLIC.

Wind colic is a severe and distressing pain in the bowels; sometimes a stoppage, and swelling about the pit of the stomach and the navel. The complaint may be caused by weakness in the digestive organs, by indigestible food, unripe fruit, or costiveness.

Treatment.—If the pain is caused by having eaten anything indigestible, an emetic should be immediately taken. If this does not bring relief, a dose of salts, or sweet tincture of rhubarb, may. If there is no sickness at the stomach, a little essence of peppermint in water, or brandy, or gin in hot water, may be sufficient to expel the wind and give relief. If there be costiveness, and continued pain, a stimulating injection should be given.

BILIOUS COLIC.

Bilious colic is a painful disease. There is griping, twisting, tearing pain about the navel, or sometimes over the whole abdomen.

Causes.—It is caused by irritating articles taken into the stomach, the presence of bile in the stomach, long exposure to cold, torpid liver and skin, great unnatural heat, etc.

Symptoms.—It comes and goes by paroxysms. Sometimes the abdomen is contracted, at other times enlarged, and stretched like a

drumhead. At first the pain is relieved by pressure, but after a time the abdomen grows tender to the touch. There is thirst and heat, and vomiting of bilious matter from the stomach. In the worst cases, the pulse is small, the face pale, the features are shrunk, and the whole body is covered with a cold sweat.

Treatment.—Administer an active cathartic immediately. Give a mixture of:—

Pulverized Camphor,.....4 grains.
Cayenne,.....1 grain.
White Sugar,.....1 scruple.

This, divided into eight powders, and given once in fifteen minutes, will relieve the pain, at the same time a mustard poultice should be laid upon the abdomen. If the pain does not yield, give a teaspoonful of paregoric. The sickness of stomach may be allayed by hot draughts in which are a few drops of laudanum; one drop of croton oil in a crumb of bread will often purge successfully; or castor oil and spirits of turpentine, equal parts, in two tablespoonful doses, may be used before trying the other. A warm bath is good, and bottles filled with hot water, placed at the feet and sides, to promote perspiration.

Eclectic Treatment for Colic.

A decoction of equal parts of skullcap and high cranberry bark, to which is added a tablespoonful of the compound tincture of Virginia snakeroot, has been found very useful. Apply over the stomach and bowels hot fomentations of wormwood and boneset, or hops, stramonium leaves, or hops and lobelia.

In flatulent colic the legs should be bathed in warm water, and poultices of mustard or hot salt placed over the bowels and stomach. The bowels may be opened with a dose of castor oil, and ginger or peppermint tea may be drunk freely. To ease the pain, from thirty to sixty drops of paregoric may be given. In very severe cases, a mixture compounded of equal parts of laudanum, tincture of camphor, and essence of peppermint, in teaspoonful doses, may be given. In some cases a teaspoonful of spirits of turpentine, taken with a teaspoonful of castor oil, has been found to give immediate relief. For painters' or lead colic, the following is highly recommended:—

Sulphate of Magnesia,.....½ pound.
Powdered Alum,.....1 ounce.
Sulphuric Acid,.....1½ drams.
Boiling Water,.....1½ pints.

Mix. Dose, a tablespoonful in a wineglassful of water; repeat every hour until it operates upon the bowels. To prevent the acid from injuring the teeth, the solution may be sucked through a quill or a glass tube. After the bowels have been freely opened, the medicine should be continued for weeks or months, in doses sufficient to produce one or two passages every twenty-four hours. The sulphuric acid, by uniting with the oxide of lead in the system, forms the sulphate of lead, which is a harmless salt.

The following is recommended to be taken by persons who are exposed to the bad influence of lead:—

Elixir Vitriol,.....½ ounce.
Tincture of Prickly Ash Berries,.....1 ounce.

Dose, a teaspoonful in a gill of water, and repeat three or four times a day.

PILES OR HEMORRHOIDS.

These consist of small tumors, situated on the extremity of the rectum. The piles are usually accompanied by a sense of weight in the back, loins, and lower part of the abdomen, together with pain in the head, sickness at the stomach, and flatulence in the bowels. If the tumor break, a quantity of blood is voided, and considerable relief from pain is obtained; but, if they continue unbroken, the patient experiences great pain.

Treatment.—The following treatment will generally prove beneficial:—

Confection of Senna,.....1 ounce.
Flowers of Sulphur,.....1 ounce.
Jalap, in powder,.....1 dram.
Balsam of Copaiba,.....½ ounce.
Ginger, in powder,.....½ dram.
Cream of Tartar,.....½ ounce.
Syrup of Ginger, a sufficient quantity to form the whole into an electuary.

Mix. Take a teaspoonful every three hours, until the bowels are freely open. At the same time make use of the following lotion:—

Goulard's Extract,.....3 ounces.
Laudanum,.....½ ounce.

Mix and apply to the parts repeatedly. When the piles are very painful and swollen, the patient should sit over steaming hot water.

Either of the following may be used to advantage:—

Powder of Oak Galls,.....1 ounce.
Elder Ointment,.....1 ounce.

Mix and anoint the parts night and morning.

Sublimed Sulphur,.....½ ounce.
Cream of Tartar,.....1½ drams.
Confection of Senna,.....1 ounce.
Syrup sufficient to form an electuary.

A teaspoonful to be taken at bedtime.

The parts should be bathed with cold water after each evacuation, then dried and bathed again with witch hazel. At bedtime insert the following suppository into the rectum:—

Cocaine,.....⅛ grain.
Extract of Hyoscyamus,.....1 grain.
Zinc Oxide,.....3 grains.

Mix and make into one suppository.

FALLING OF THE BOWEL.

Prolapse of the rectum most frequently occurs with children and aged persons, though it takes place at all ages, and commonly in connection with piles, irritation from worms, or stone in the bladder; much straining of the bowels at stools will also occasion it.

Treatment.—The bowel may be returned without difficulty, by means of gentle pressure with the fingers, covered with oil. If allowed to remain down long, it will become swollen, congested, and require the aid of a physician. Children so affected should have their bowels kept in a lax state with gentle aperients, and they should not be suffered to remain long on the stool; the loins should also be bathed with cold water; and an enema, consisting of a grain of sulphate of iron, dissolved in an ounce of rain water, should be thrown into the bowels after each motion.

INFLAMMATION OF THE PERITONEUM OR PERITONITIS.

This is an exceedingly painful and dangerous disease, from its extent and connection with important organs. It may exist either as an acute or chronic disease.

Causes.—Its causes are various, as cold, mechanical injuries of the peritoneum, the development of tumors, etc. Women in childbed are peculiarly liable to it.

Symptoms.—There is usually great pain, tenderness and board-like hardness of the abdomen, accompanied with fever, and a frequent pulse. Sometimes, at first, the pain is confined to one spot; but it generally soon extends over the whole of the abdomen. It is very severe, and much increased by any motion, even coughing, sneezing, or drawing a long breath. Even the weight of the bedclothes is sometimes unbearable. The pain is acute and cutting, and sometimes occurs in paroxysms; and the patient usually lies on the back with the knees drawn up. The bowels are usually constipated, but sometimes the reverse; and commonly there are present nausea, vomiting, and hiccough.

Treatment.—Apply hot fomentations and at once send for a physician.

FISTULA.

This is a troublesome ulcer near the anus, which communicates with the rectum.

Causes.—Persons who follow sedentary occupations are more liable to them.

Treatment.—Sometimes a cure will be effected by attending to the general health, and the injection of some astringent lotion, as solution of sulphate of zinc (forty grains to one pint of water). If this fails, it will be necessary to make a complete division with the knife of the whole of the parts between the fistula and the bowel, and the edges of the wound kept apart by lint, in order to allow the cavity to fill up by granulation.

OBSTRUCTION OF THE BOWEL.

An impediment, either mechanical or paralytic, against the passage of matter through the intestine.

Causes.—Innervation of the bowel; malformation; telescoping of one portion of the bowel into the other; the growth of bands or membranes; the passing of the bowel through other openings, as in hernia or rupture; twisting of the bowel upon itself so as to obstruct the passage; the presence of foreign bodies in the bowel.

Symptoms.—Sudden and violent pain; vomiting; passing of bloody mucus when the form of telescoping is present and the obstruction is only partial; straining; complete constipation; vomiting sometimes of a sort of fæcal matter; rapid pulse; and high temperature.

Prognosis.—The general prognosis is not very good. The liability to sloughing of the parts, or of perforation, is very great. Operation with proper antiseptic observance gives much better results than formerly and the ratio of fatality is constantly decreasing. Where the cause is simple paralysis of the bowel there may be nothing more than a twisting of the bowel, which may suddenly right itself.

Treatment.—The treatment is invariably surgical.

APPENDICITIS OR INFLAMMATION OF THE APPENDIX.

Inflammation of the vermiform (worm-shaped) appendix, an opening into the cæcum (the enlarged commencement of the large intestine). The vermiform appendix is about one third of an inch in diameter and from one to six inches long. It does not lead anywhere and its use is obscure.

Causes.—About 85 per cent. of the cases are due to the presence of micro-organisms lodged in the appendix under favorable conditions of growth. The majority of the rest of the cases are due to the presence of fæcal matter and a few of them to the presence of foreign bodies, such as stones of small fruits, etc. As this is a blind passage without means of drainage very favorable conditions for the growth of micro-organisms may easily be set up in it. While the disease attacks all ages it occurs most frequently between the fifteenth and the thirtieth years. It attacks six times as many men as women, probably by reason of the greater frequency of catarrhal inflammatory diseases among men. It is least common among the poorer classes. The inflammation passes through the several stages of simple inflammation, ulceration, gangrene, and perforation. The greatest fatality attends the gangrenous type, from which sudden death often results without much preliminary disease. The greatest pain is felt from the formation and imprisonment of pus in the appendix.

Symptoms.—The symptoms vary not only in kind but in degree; so that it cannot be said that any one line of symptoms will be present in all cases. There is always pain in the abdomen, but it is often so distributed that the patient is unable to locate it with precision. This

pain varies from sharp, to agonizing, but its attack is usually sudden. A valuable indication of the disease is the rigidity of the muscle on the right side running from the pubic bone up to the ribs. Sometimes there is vomiting, slight fever, and quick pulse. After some days there may be a swelling on the right side of the abdomen due to the formation of pus.

Prognosis.—This varies with the type of the disease. Simple inflammatory cases will probably all recover. Gangrenous cases will probably all die. The latter demand prompt surgical care, in which case a majority may recover.

Treatment.—Rest in bed; application of ice over the appendix. The intestines are not allowed to do any work that can be avoided. No food or drink is to be taken; no purgatives are used; and no muscular exertion is to be permitted. This is intended to reduce or to control the inflammation and is maintained for thirty-six hours. If at the end of that time there is not a marked improvement, an operation is necessary. In such cases the operation is usually performed without an hour's delay. But when there is an improvement, the prevailing practice is to postpone the operation until after there has been a recurrence of the attack; then to operate in an interval. But of course all of that is a matter for the surgeon to decide.

DISEASES OF THE LIVER AND SPLEEN.

JAUNDICE OR ICTERUS.

Catarrhal inflammation of the mucous membranes of the bile-ducts by which the flow of bile is obstructed.

Causes.—Inflammation excited by excesses of eating and drinking; exposure; congestion of the liver; pneumonia; malaria; and fevers.

Symptoms.—Pain in the stomach; foul tongue; loss of appetite; nausea and vomiting; slight diarrhœa; and fever. After from three to five days the whites of the eyes become yellow; the whole body gradually assumes a yellowish tinge; the fever disappears; the skin is dry and itches; the bowels constipated; stools clayish or whitish in color; wind in the bowels; much colic; urine scanty and dark-colored from the presence of bile products.

Prognosis.—The disease usually runs two or three weeks and the termination is favorable.

Treatment.—The patient should rest in bed; avoid exposure; and eat ripe fruits, vegetables, milk and limewater, broths, lean meat, eggs. No starch, sweet food, or fats should be given.

The bowels must be kept open by:—

Calomel,.....¼ grain.
Bicarbonate of Soda,.....3 grains.

Take one such powder every two hours until twelve have been taken; then follow with a dose of Hunyadi Janos water.

Or:—

Bicarbonate of Soda,.....4 drams.
Tincture of Nux Vomica,.....2 drams.
Tincture of Capsicum,.....1 dram.
Tincture of Rhubarb,.....2 ounces.
Compound Infusion of Gentian,...to make 6 ounces.

Take a dessert-spoonful in water every three or four hours.

The itching of the skin may be relieved by sponging with a weak solution of carbolic acid; or by a hot bath in which a little carbonate of potassium has been dissolved. This bath may be given night and morning.

Eclectic Treatment for Jaundice.

As the stomach is usually disordered, it is well to give an emetic, and after it has acted freely administer a gentle purge. Should there be coldness about the feet or body, use the hot bath, or bathe the whole body with hot vinegar and water. A decoction made of dandelion and barberry root may be drunk freely. If these do not give immediate relief, take the following:—

Golden Seal and Capsicum, of each,.....1 dram.
Bitter Root and White Poplar Bark, of each, 2 drams.
Cover with boiling water. When cool, add half a pint of Holland Gin.

Dose, a wineglassful three times a day.

A strong tea of peach tree leaves, about half a pint taken daily; or from ten to forty drops of the tincture of bloodroot, taken three times a day, either in water or herb tea, have been highly recommended.

GALLSTONES.

Gallstones are concretions, sometimes formed in the gall bladder; they vary greatly in size, some being smaller than a pea, and some as large as a walnut; they often remain in the gall bladder without

causing any uneasiness; but, when one of any considerable size passes into the duct, it gives rise to violent spasmodic pains which cease only when the stone has effected its passage into the bowels. The gall duct is, in caliber, no larger than an ordinary goose quill, and therefore this operation is often a difficult and protracted one; its symptoms are agonizing pain in the region of the bladder, often accompanied by shivering and vomiting; when the obstruction has passed into the common duct, and so stopped the flow of bile from the liver, there will be jaundice, with white and chalky stools. When there are these symptoms, with absence of pain on pressure, and no fever, we may safely conclude that inflammation is not the exciting cause, but gallstones.

Treatment.—The proper treatment in an attack of this kind is hot applications over the seat of pain. The pain should be relieved by anodynes or the hypodermic injection of morphia. Such treatment, however, is safe only in the hands of a competent physician. There is commonly great acidity of the stomach while gallstones are passing; hence an alkaline draught is of service, say half a teaspoonful of bicarbonate of soda in a good quantity of warm water. Should the stomach reject these remedies, an anodyne may be administered in a clyster (forty drops of laudanum, in a pint of thin gruel). Hot bran poultices, sprinkled with laudanum, may be applied to the seat of pain.

During the passage of gallstones much relief may be obtained by the use of ether, one dram to a pint of olive oil, one half of this amount to be taken during the seizure and repeated in twelve hours.

When the foregoing lines of treatment fail there is danger that the calculus or stone may perforate the gall bladder or the walls of the biliary passages and surgical intervention should be sought.

CONGESTION OF THE LIVER.

In this condition the arteries or veins are over-distended with blood, causing slight jaundice, melancholia, and digestive disturbances. When the veins are congested the cause is due to disease of the heart and lungs. When the arteries are congested the condition may be due to alcoholism, irregular dietary, constipation, or atmospheric changes.

Symptoms.—Headache, feverishness, a furred tongue, loss of appetite, nausea, sometimes vomiting, constipation, and the urine is suppressed and highly colored. The skin becomes gray, sallow, or muddy in color. The white of the eye is tinged with yellow. There

is sense of weight in the region of the liver and weariness in the lower extremities.

Treatment.—When associated with disturbances of digestion, wash out the stomach by drinking copiously of lukewarm water and irritating the throat to cause the water to be returned. Then give a dose of castor oil, or calomel one-fourth grain and bicarbonate of soda one grain every half hour for six or eight doses; follow this with a dose of salts (Epsom or Rochelle), or a dose of Hunyadi water.

A light nutritious diet together with bitter tonics, such as nux vomica ten drops, dilute nitro-hydrochloric acid ten drops, in half a glass of water fifteen minutes before each meal, constitutes the subsequent treatment. When due to disease of the heart and lungs, the treatment will be directed to these organs and a competent physician consulted.

GIN-DRINKER'S LIVER.

This condition is due to diseases of the heart and lungs, syphilis, and chronic alcoholism.

There are two types—that in which the liver contracts and that in which the liver is enlarged.

Symptoms.—Those of a chronic catarrhal condition of the stomach and bowels associated with a slight jaundice, the urine being scanty and high colored and on standing throwing down a heavy deposit. There is abdominal dropsy, more or less pain over the region of the liver, nausea, and vomiting. The vomited matter contains blood, and the stools are sometimes tarry owing to the presence of blood. The patient becomes emaciated and greatly debilitated. Death usually follows within a year after the appearance of abdominal dropsy.

Treatment.—Consult a physician at once.

CANCER OF THE LIVER.

This condition affects men most frequently. It is rarely found in women and children. The disease makes its appearance usually after the fortieth year.

Causes.—Heredity, and possibly a cancer germ; this latter point is not yet settled.

Symptoms.—General ill health, loss of appetite, nausea, vomiting, jaundice, constipation, loss of strength and weight. There is usually

some tenderness and pain, increased by pressure over the region of the liver. Sometimes a distinct tumor mass may be felt in the vicinity. Fever is not common and when present is only moderate. Towards the termination of the disease the additional symptoms are headache and delirium.

Treatment.—Treatment is unsatisfactory. The condition terminates in death, but medical aid should be sought for relief of the early symptoms and later will be required for relief of pain.

INFLAMMATION OF THE SPLEEN.

This is often the result of chills and fever, and is very difficult and stubborn to cure.

Symptoms.—A feeling of tightness and pain in the left side—the pain being increased on pressure, or by lying upon the left side. Sometimes the organ enlarges, so as to be felt by the hand. There is sometimes numbness, weakness of the legs, palpitation of the heart, difficulty of breathing, inability to exercise much, obstinate constipation, vomiting of food, piles, dry skin, tongue coated white or red, low spirits, and occasionally dropsical affections.

Treatment.—Treatment should be about the same as in inflammation of the liver. After the active inflammation is subdued, the warm bath may be used once or twice a week. In the chronic form of the disease, counter-irritation with the compound tar plaster, with mustard poultices, or tincture of iodine, will be particularly needed. Keep the bowels open, and, if the patient is pale and bloodless, give iron combined with quinine and arsenic as a tonic. The following may be used:—

Dried Sulphate of Iron,.....30 grains.
Quinine,.....1 dram.
Arsenious Acid,.....1 grain.

Mix and divide into thirty pills. Take one three times a day.

DISEASES OF THE KIDNEYS.

DIABETES INSIPIDUS OR EXCESSIVE FLOW OF URINE.

This condition is more frequently met with in men than women. It occurs in early adult life.

Causes.—It may be hereditary, or it may be due to certain diseases of the nervous system; diseases of the brain; spotted fever; and injuries to the head.

Symptoms.—The affection is characterized by great thirst, and enormously increased flow of urine, which is pale or very light straw color. The amount passed in twenty-four hours may be from one to six gallons. The urine is slightly acid, contains neither albumen nor sugar. The general health of the patient is usually good, but the appetite is voracious.

Treatment.—If syphilis is a causative factor mercury and the iodide of potash will prove of benefit. When due to nervous irritability, use the following:—

Valerianate of Ammonia,.....40 grains.
Sodium Bromide,.....2 drams.
Compound Spirits of Lavender,.....1 ounce.
Simple Elixir,.....to make 2 ounces.

Mix. Give one teaspoonful three times daily in a wineglass of water.

Constipation should be relieved by the use of one compound vegetable cathartic pill at bedtime. (See "Constipation," page 370.)

DIABETES MELLITUS OR SUGAR DIABETES.

Symptoms.—This condition, met with in middle life and more frequently affecting men, is evidenced by an increased flow of urine—as much as seven or eight gallons may be voided in twenty-four hours. The color of the urine is pale, the odor sweetish, and sugar is constantly present. There is excessive thirst and appetite. The bowels are constipated, the skin is harsh and dry. The breath has a sweetish odor. The loss of weight and strength is progressive. The temper is irritable and the external genital organs itch intensely. The circulation in the extremities is sluggish. Disturbances of digestion, melancholia, and diseases of the heart, lungs, liver, and kidneys frequently appear during the course of the disease. Gangrene of the extremities is another complication met with. The diabetic patient is usually impotent.

Treatment.—Consult a physician. The condition can be greatly ameliorated and some cases cured by careful dieting and judicious treatment.

CONGESTION OF THE KIDNEYS OR RENAL CONGESTION.

This is an acute catarrhal inflammation of the kidneys. Two varieties are known, termed active or arterial congestion, and passive or venous congestion.

Causes.—The active variety is due to exposure to cold, injuries to the kidney region, extensive superficial burns, certain fevers, and the elimination in the urine of irritant substances, such as cantharides, copaiba, cubebs, turpentine, chlorate of potash, carbolic acid, etc.

The passive variety is due to clotting of blood in the renal (kidney) vessels or diseases of heart or lungs.

Symptoms.—Pain over the kidneys and running diagonally down to the pelvis and testicles, irritation of the bladder with constant or pressing desire to urinate, the urine being scanty, high colored, and containing some blood and albumen. There is headache, nausea, and sometimes vomiting.

In the passive variety, when due to diseases of the heart or lungs, the urine is scanty, high colored, and contains albumen; dropsy soon appears.

Treatment.—If the condition is not promptly treated serious damage to the kidney structure and chronic Bright's disease may develop. Therefore one should not attempt self-treatment but should consult a qualified physician.

ACUTE BRIGHT'S DISEASE.

Causes.—This disease may follow congestion of the kidney or be associated with infectious fevers such as scarlatina, diphtheria, typhoid, etc. It is frequently met with in the course of pregnancy or may be due to the elimination of certain irritants such as cantharides, copaiba, turpentine, carbolic acid, arsenic, etc.; exposure to cold; injuries to the back.

Symptoms.—It is a disease occurring in early life; at any rate it is more common in young than in old life. Dropsy is an early symptom, appearing first in the face with puffiness of the lower eyelids and later extends to the lower extremities and then to the abdomen. The onset, when sudden, is characterized by chill, fever, nausea, and persistent vomiting, aching pains in the small of the back, diarrhœa, irritation of the bladder and a desire to pass water frequently. The urine being bloody, presents an appearance like beef washings. There

is decided anæmia and general weakness. The condition lasts from ten days to three or four weeks. Affections of the heart, lungs, pleura, and peritonitis may develop as complications.

Treatment.—Call a physician at once. Put the patient in bed, administer plenty of water and a strict milk diet. The outlook is favorable if promptly treated, but as uræmic poisoning may develop, self-treatment should not be risked.

CHRONIC BRIGHT'S DISEASE.

There are two distinct types of chronic Bright's disease: one in which the connective tissue of the organ is stimulated to overgrowth resulting in a large white kidney; the other in which the kidney substance contracts and is called a small, red, granular, gouty, or contracted kidney.

Large White Kidney: This sometimes follows acute Bright's, or may be due to chronic malarial poisoning, chronic alcoholism, chronic mercury poisoning, syphilis, etc., and is a disease occurring usually before the fortieth year.

Symptoms.—In the beginning the symptoms may not be well defined. Later there will appear puffiness of the lower eyelids and face, marked anæmia, emaciation, and general weakness. The quantity of urine in the beginning is decreased but frequently voided. Later in the disease, when the kidney substance contracts and we have to deal with a contracted white kidney, the urine changes from a high colored fluid to a thin watery liquid and is increased in amount. Albumen is constantly present in the urine of this type of Bright's.

Dropsy eventually becomes general, and when the pleural sacs or cavities are involved, breathing becomes very difficult from compression of the lungs by fluid. A dropsical laryngitis may develop and the voice become husky.

Treatment.—Rest in bed and a milk diet are of prime importance. The dropsy is relieved by purgation and sweating. A splendid diuretic to increase output of urine, lessen the amount of albumen and overcome general weakness is the following:—

Strychnia Sulphate,.....¼ grain.
Tincture of Chloride of Iron,.....5 drams.
Solution of Ammonium Acetate,.....2½ ounces.
Sweet Spirits of Niter,.....1½ ounces.
Water,.....to make 6 ounces.

Mix and take one teaspoonful every four hours followed by a glass of cold water.

If the condition is due to syphilis, anti-syphilitic treatment will be required. A course of quinine in addition to the above diuretic will benefit cases due to chronic malaria.

Prognosis.—As the condition is serious and unless carefully treated leads to a fatal ending, one afflicted with this disease should place himself under the continued care of a competent physician.

Small, Red, Granular, or Contracted Kidney: This is a disease of middle life and old age and is rarely met with earlier than the fortieth year. It affects men more commonly than women.

Causes.—Somewhat similar to those of Large White Kidney; gout, alcoholism, mercury or lead poisoning, syphilis, worry, and the excessive consumption of red meats.

Symptoms.—The disease is frequently well established before it is recognized. There is great thirst, also disorders of digestion, with loss of weight, and impaired hearing and vision. The skin is of a dead white, pasty color, is harsh, dry, scaly, and itches intensely. Nosebleed and cerebral hemorrhage are common. Nausea and vomiting occasional. The patient is drowsy. Convulsions, epilepsy, or apoplexy may develop. Dropsy, save of the white of the eye (the Bright's eye), seldom appears. Because of changes in the heart and blood vessels, there is shortness of breath on slight exertion. The urine is increased and of a pale and colorless appearance; there is rarely any sediment. Albumen is occasionally present.

Treatment.—Rest and selected diet. Avoidance of alcoholic beverages. As uræmic poisoning is very common and very severe in this type of Bright's disease, the patient should not attempt self-treatment, but abide by the advice of a qualified physician.

URAEMIA.

Causes.—By this term is meant certain manifestations of disturbances of the higher nerve centers, due to poisons, or waste products circulating in the blood, which poisons, or waste products, the kidneys fail to eliminate, as in Bright's disease and other affections of the kidney; in the course of pregnancy; and after operations on the rectum, uterus, bladder, etc.

Symptoms.—It may develop gradually, or suddenly with convulsions followed by stupor, or coma. There is suppression or decrease

of urine and more or less general dropsy. Usually the condition begins with a chill, or chilliness, dizziness, headache, and disturbances of vision and hearing. Gastro-intestinal symptoms may predominate—nausea, vomiting, rapid breathing, fever, and increased pulse rate, the vessels being full and tense. These symptoms may be followed by convulsions and death, or the patient passes into a profound sleep and dies.

Convulsive seizures may predominate; these are epileptic-like, and there may or may not be loss of consciousness. There is high fever, rapid pulse, and short hurried breathing. The patient may pass into a profound sleep, the subject being overcome by the poison in the blood—death ends the scene; or he may, after deep sleep of several hours, awaken and make a good recovery.

Another manifestation of uræmia is that which comes on slowly with drowsiness, headache, and general irritability, and associated gastro-intestinal disorders, high fever, rapid pulse and respiration, or suddenly the patient is struck down as in apoplexy. The breathing sound is of a hissing character, the fever is high, the pulse flabby and weak but rapid, and consciousness is never regained. Or after sleep, more or less profound, the patient slowly recovers.

Treatment.—Send immediately for a physician. Put the patient to bed. Remove the clothing. Apply artificial heat by means of hot water bottles (being careful not to burn the patient), or bathe with hot water and alcohol. Inject two or four tablespoonfuls of Epsom salts in four or five ounces of warm water into the rectum to promote elimination through the bowels, and to stimulate the flow of urine. Apply hot cloths, wet with the infusion of foxglove (digitalis) over the bladder.

Morphia sulphate, one fourth grain by hypodermic injection and repeated in two hours if needed, is most efficient in controlling convulsions. Subsequently after an acute attack of uræmia, Keasbey and Mattison's Alkalithia, a teaspoonful in a glass of water (not too cold) one half an hour before meals, is of much benefit as a stimulating diuretic.

SUPPRESSION OF URINE.

If there is a frequent desire to pass water, attended with much difficulty, it is called *Strangury*. If none is made it is called suppression of urine.

Causes.—Inflammation of the urethra; a lodgment of hard, fæcal matter in the rectum, spasm at the neck of the bladder, exposure to cold, intemperance, stone in the kidneys or bladder, and enlargement of the prostate glands.

Symptoms.—A constant desire, or feeling of necessity, to pass water, with pain and difficulty in passing it; and much enlargement of the bladder. If stone in the kidney be the cause, there is often nausea, vomiting, and acute pain in the loins; if stone in the bladder, the stream of water will be divided into two or suddenly checked.

Treatment.—If much inflammation and irritation exist, all straining to expel the urine should be avoided, and a catheter should be introduced every six hours, to draw it. The following will be found very useful remedies: Anodyne diuretic draught:—

Mucilage of Gum Acacia,.....6 ounces.
Olive Oil.....1½ ounces.

Mix well in a marble mortar, then add:—

Sweet Spirits of Niter,.....6 drams.
Laudanum,.....1½ drams.
Fennel Water,.....3 ounces.

Mix and take three tablespoonfuls every three hours.

Or this: Demulcent diuretic draught:—

Acetate of Potash,.....2 drams.
Laudanum,.....1½ drams.
Syrup of Marshmallows,.....1½ ounces.
Fennel Water,.....8 ounces.

Mix. Take three tablespoonfuls every three hours.

The bowels may be kept free by using the following emollient clyster:—

Balsam of Copaiba,.....2 drams.
The yolk of an egg.

Rub this and the balsam together; then add:—

Castor Oil,.....½ ounce.
Laudanum,.....1 dram.
Compound Decoction of Marshmallows,..11 ounces.

Mix. Inject up the rectum; this soothes the parts.

INCONTINENCY OF URINE.

This is rather a more troublesome than dangerous complaint, and young children and aged persons are most liable thereto.

Causes.—Most generally from a relaxation of the sphincter muscle of the bladder, from weakness, but sometimes it is caused by some irritating substance in the bladder, as a too acid condition of the urine or an inflammation of the mucous layer of the bladder; in children, it may arise from sleeping on the back, or from worms or eating too heartily at night.

Treatment.—For children:—

Citrate of Potash,.....1 dram.
Sweet Spirits of Niter,.....6 drams.
Camphor Water,.....to make 2 ounces.

Mix. Two teaspoonfuls in a wineglass of water every three hours. Not to be given after four P. M.

For adults:—

Tincture Iron Chloride,.....3 drams.
Tincture Nux Vomica,.....2 drams.
Tincture Cantharides,.....2 drams.
Fluid Extract of Belladonna,.....1 dram.
Water,.....to make 3 ounces.

Mix. Take a teaspoonful three times daily after meals.

GRAVEL OR RENAL CALCULI.

The condition of "stone in the kidney" due to the formation of accumulations of solid matter derived from the urine.

Causes.—The conditions which are the fundamental cause of this formation are not at present quite clear. The fact that there is a quantity of solid matter in the urine is not the cause; for solid matter is present in all urine. There is a sticky, albuminous substance present which binds the solid matter together, and there is also some influence which causes it to form crystals. The stones are of all sizes from that of sand, which takes the common name of gravel and is often passed out through the urethra with the urine; up to a size of two or three inches in circumference, so that these cannot pass out through the natural channels. They vary also in color according to the nature of the solid matter of which they are composed. Those of uric acid and the urates are red and smooth; those of the phosphates, white and rough. Stones often show layers of different colors when cracked open, which is the result of deposits of different matter at different times.

Symptoms.—Stones may be present in the kidneys for years without any indications of their presence. Sometimes the first sign is the

passage in the urine as gravel. But when the stone escapes into the ureter, it sets up that chain of symptoms known as renal colic. The pain in this case often becomes excruciating agony. It is caused by the stoppage of the passage by the stone; by the pressure of the urine upon the stone, which often causes a tearing of the membranes; and by the natural contraction of the ureter on account of the presence of the stone in it. The pain of renal colic does not confine itself to the immediate vicinity of the kidney and parts most affected; but radiates so as to extend into more remote parts. The paroxysms of pain may last for a few minutes or for hours. They often terminate suddenly on the escape of the stone into the bladder. Presence of blood in the urine on testing is a symptom of great value. This is from the laceration of the parts caused by the passage or lodgment of the stone.

Prognosis.—The condition is serious and, while not an essentially fatal disease in many cases, there is always fear lest the patient die during the lodgment of the stone. The danger of recurrence is also great.

Treatment.—This is directed first of all to the relief of the patient from the horrible agony of the "colic." A hypodermic injection of morphine, or of atropine, is often needed. Inhalations of chloroform are often given when the heart can stand it. If the patient is quiet enough hot applications over the kidneys are helpful. In the intervals the patient must drink copiously of a good water; if the urine is alkaline, he must take a lithia water.

The following will render the urine acid:—

Urotropine,.....5 to 7½ grains.

Take one such dose every three hours.

Or:—

Ammonium Benzoate,.....20 grains.

Take one such dose in water every three hours.

If the urine is acid, large quantities of water should be drunk daily and:—

Bicarbonate of Potassium,.....15 to 20 grains.

Take one such dose three or four times a day.

The diet must be carefully attended to; and any evidence of the presence of intestinal indigestion must be acted upon at once. Sweet wines and beer are not to be taken; no alcohol of any kind is the better rule.

As exercise carries off the excess of uric acid, it is well for the

patient, more especially if he lead a sedentary life, to carry healthful exercise almost to the point of fatigue. At the same time he must drink copiously of water suited to his needs. Large draughts of water are necessary to keep the urine at the proper point of dilution. This is an effective way of carrying off the solid constituents of the urine, by which the formation of the stones is carried on.

Serious and complicated cases of this disease require the attention of a surgeon.

INFLAMMATION OF THE BLADDER OR CYSTITIS.

Inflammation of the mucous membrane lining the bladder.

Causes.—Retention of the urine and consequent distention of the bladder; foreign substances such as large stone in the bladder; inflammation of the adjacent parts and organs; enlarged prostate gland; chronic Bright's disease; and stricture of the urethra.

Symptoms.—The acute form of the disease is marked in its approach by chills; fever; loss of appetite; and sleeplessness. The urine is frequently passed but only drop by drop, and the effort is followed by severe straining efforts. Pain over the bladder and a burning sensation in the urethra follow. The urine is often of bad odor and cloudy.

Prognosis.—This is governed by the cause. Ordinarily acute inflammation is of favorable termination. When chronic, it is incurable after enlargement of the bladder ensues.

Treatment.—A milk diet with careful avoidance of highly seasoned or stimulating liquids; rest in bed; and warm applications over the bladder. The bowels are to be kept open, for which purpose use:—

Bitartrate of Potash,.....1 dram.
Tincture of Senna,.....1 dram.
Manna,.....½ ounce.
Warm Water,.....1½ ounces.

To be taken at one dose.

If the urine is acid (for tests of urine, see Index) the urine must be well diluted by copious drinking of a good lithia water.

If the urine is alkaline, it may be changed by use of:—

Ammonium Benzoate,.....20 grains.

Take one such dose every three hours.

Or:—

Solution of Citrate of Potassium,.....1 ounce.

Take one such dose every three hours.

The general condition excited by the disease is much improved by use of:—

Tincture of Hyoscyamus,.....6 drams.
Paregoric,.....6 drams.
Bromide of Potassium,.....8 scruples.
Bicarbonate of Soda,.....8 scruples.
Solution of Potassium Citrate,....to make 8 ounces.

Take a teaspoonful in water every two hours.

Chronic inflammation of the bladder is attended by dull pain and frequent, scanty flow of urine. The urine contains large quantities of pus; upon standing, a sediment of the nature of the white of an egg forms; this sediment shows phosphates and pus globules under the microscope.

Prognosis.—This is not favorable in chronic cystitis.

Treatment.—The diet should be mild and the alkaline mineral water should be freely used. Eucalyptol, in from ten to fifteen drop doses every four hours, well diluted; or from five to ten drops of santal oil in capsules after meals may be given internally. The bladder may very beneficially be irrigated with an antiseptic every day. For this purpose use, first, tepid water, about two ounces, for a few days, then every day either:—

Salicylate of Soda,.....1 dram.
Water,.....1 pint.

Or:—

Boric Acid, ...1 dram.
Water,.....1 pint.

Only two ounces of either of these to be used until the capacity of the bladder is determined.

INFECTIOUS DISEASES OF ADULTS.

DENGUE OR BREAKBONE FEVER.

An acute, epidemic fever (pronounced *dangay*), often called dandy fever.

Causes.—It is believed that a micro-organism causes dengue. It is a disease of warm climates, being restricted in America to the southern states. It breaks out in a locality with sudden violence and attacks all classes and ages; but it disappears in cold weather and is not met with in high altitudes.

Symptoms.—The fever quickly rises to 105°; intense headache; burning pains in the temples; pain in the back; swelling in the joints; stiffness; pain in the muscles; nausea; vomiting; constipation, and a scarlatina-like rash. This stage lasts for from a few hours to two or three days. The symptoms then subside and there is an interval of two or three days. The second attack of the spasm is equally sudden but far less severe: the patient is weak; the rash is intensely itching; it remains for two days, and the skin peels off. The disease lasts for about eight days. Relapses are very common.

Prognosis.—The outcome is always favorable in cases of healthy adults; old age and a state of debility are serious conditions, and it is among such cases that the greatest number of deaths occur.

Treatment.—Absolute rest in bed is required, and in mild cases this is often all the treatment that is needed. In severe cases, an antipyretic and sedative is given such as:—

Potassium Citrate,.....5 grains.
Sweet Spirits of Niter,.....30 drops.

Take one such dose in a dessert-spoonful of water three times a day. The headache is relieved by applications of ice to the head (see page 241). If the face is flushed and there is throbbing in the head a hot foot bath is advisable. (See page 257.) The pains in the body are relieved by a hot tub bath. If the fever is high and long continued, which is seldom the case, sponging with tepid water will reduce it. (See page 251.) The poisons of the fever are eliminated by the kidneys; to insure this, the patient should be encouraged to drink freely.

ERYSIPELAS.

An acute infectious disease marked by more or less fever and a peculiar inflammation of the skin.

Causes.—The micro-organism *Streptococcus erysipelatis.* A state of weakness or of debility and abrasions of the skin are predisposing causes. It is not a strongly infectious disease; one attack predisposes to others.

Symptoms.—Erysipelas comes on suddenly with a chill; nausea; vomiting; sometimes convulsions; general illness; headache; pains in the limbs, and a fever of about 105°; pulse is correspondingly high; tongue, coated; diarrhœa or constipation; urine, high-colored and scanty; delirium is often present. An eruption of red spots appears, and soon they run together to form a violet or crimson patch on the skin, generally on the face and neck. The patch is swollen, hot, and tender; the border is well-marked and distinct. The affected parts burn, tingle, and itch; the surrounding parts are dropsical and puffy; this continues for five or six days; then the skin of the affected part peels off and the fever declines. Sometimes the disease is inclined to creep to other parts; it is then called "traveling erysipelas."

Prognosis.—Recovery is almost certain except in cases of those suffering from chronic alcoholism, and in the traveling form.

Treatment.—In mild cases a laxative should first be given. This is followed by:—

Tincture of the Chloride of Iron,.....2 drams.
Glycerine, ...1 ounce.
Water enough to make.....2 ounces.

Take one teaspoonful three times a day. Apply vaseline to the eruption.

Or:—

Ichthyol, ...1 dram.
Vaseline, ...1 ounce.

Use as an ointment to the affected part.

In severe cases the patient should take:—

Sulphate of Quinine,.....2 grains.
Extract of Belladonna,.....¼ grain.
Tincture of Chloride of Iron,.....10 to 20 drops.

Take one such dose every three hours.

The diet should be liquid, and it may be necessary to use alcoholic stimulants, preferably a good port wine.

For local treatment the following produces excellent results:—

Carbolic Acid,	½ ounce.
Oil of Turpentine,	1 ounce.
Tincture of Iodine,	1 ounce.
Alcohol,	1 ounce.
Glycerine,	½ ounce.

Apply locally to the eruption.

Or:—

Sugar of Lead,	1 dram.
Water,	1 pint.
Laudanum,	1 dram.

Pour a small quantity on a cloth and apply to the part.

HYDROPHOBIA OR RABIES.

An acute, infectious disease originating in the lower animals and communicated by them to man.

Cause.—The cause is a peculiar virus contained in the nervous system, saliva, and urine of animals. This is conveyed to man usually by the breaking of the skin by a bite. It is believed that it is occasioned by a micro-organism, but that fact is not yet clearly established. The disease shows itself in about 15 per cent of the number of cases of dog bite. It appears in from one week to two or more months from the time of the bite. If it does not appear within three months the chances are very great that the person will escape it.

Symptoms.—The first stage lasts about twenty-four hours. The part begins to itch and burn, and the old scar may reopen. There are fear, anxiety, thirst, and the so-called fear of water, from which the disease takes its name. This symptom, on attempting to drink, is caused by the spasm of the pharynx, which is aggravated upon the thought of swallowing. This is the marked symptom of hydrophobia and serves to identify the disease. The stage of excitement follows, with difficulty in breathing and swallowing; there is marked sensitiveness to light and sound; fever to 103°; often mania or delirium. This lasts for from one to three days. In the last stage the spasms subside; the heart fails; there is great prostration; and death follows from either convulsions or suffocation. This stage lasts for from six to eighteen hours.

Prognosis.—In true hydrophobia, recovery is very rare after the disease is established.

Treatment.—Immediate excision (cutting out) of the wound or burning with caustic or hot iron is imperative. If no other means are at hand the virus may be sucked out of the wound. This can be done

without fear of contagion provided there are no sores or scratches in and around the mouth for the poison to enter. The object in burning or cauterizing is to prevent the absorption of the poison into the system, either by removing the poison or by closing up the mouth of the absorbing vessels. The spasms may be controlled by a narcotic. The patient's strength is to be kept up by rectal feeding, as swallowing is impossible. (See page 236.)

Symptoms of Hydrophobia in a Dog.—It is really of more importance in diagnosing this disease to know the symptoms which appear in a dog than to know about those which appear in man. For if we can be quite sure that the dog does not show any signs of madness, we have the assurance that the person bitten will not be affected. The habit of shooting or otherwise killing a dog that has bitten one is wrong, at least until after an opportunity for a thorough study of his case has been afforded. Dr. Hare says that a dog is at first stupid and heavy and often cross and restless. When he stands up he is inclined to sway and stagger as he runs. He refuses food and water, though he may gulp down pieces of cloth, wood, etc. He may be obedient and not bite his master. He may bark at and bite strangers. His bark is hoarse and muffled, more of the nature of a series of yelps. The lower jaw never closes completely as in health. Then follow thirst and the inability to drink by reason of the contraction of the muscles of the throat, which are first attacked by the disease. Then comes the stage of excitement, in which he develops mania or delirium, running about as though in fear; mouth open; saliva flowing from it; and the dog seems to be blinded, for he runs into objects that he meets, snapping and biting. Emaciation comes on quickly. Paralysis follows; convulsions; and death on the sixth, eighth, or tenth day.

It is not generally known that there is a form of the disease called the "dumb rabies," in which the dog does not bark or display any signs of mania or delirium. Dr. Gill, a veterinary surgeon of New York, has said that the dog has the appearance of having a bone in his mouth. He not only does not avoid water but often plunges into it and swims. Dr. Gill's advice on this point is: "Beware of a dog when he becomes dull and hides away, appears restless, is always on the move and prowling, whose countenance is somber and sullen, and who walks with his head down like a bear. Beware of one who barks at nothing when all is still. Beware of the dog that barks incessantly and tears up things. Look out for the dog that has become too fond of you and is continually licking your hand and face; and beware, above all, of the dog that has

difficulty in swallowing, who appears to have a bone in his throat, and of one who has wandered away from home and returns covered with dirt, exhausted and miserable."

INFLUENZA OR LA GRIPPE.

An acute, highly infectious, febrile disease, which affects large areas at the same time.

Causes.—It is caused by the bacillus of Pfeiffer, which was first isolated and studied in 1892, when the disease came into prominence during the epidemic. It can be conveyed by contact and the usual infectious methods; the germs remain in the nasal passages for some time after an apparent recovery so that it is possible for a person to reinfect himself. Atmospheric influences seem to be instrumental in the wide spread of the disease; and debilitating diseases which leave the patient's vital resistance lowered also are predisposing causes.

Symptoms.—Ordinary cold in the head, coryza, and influenza have many symptoms in common during the early stages. There are severe chill; rapid rise of temperature to 105°; general illness; congestion of the nasal passages; difficulty in breathing; general depression; pain in the chest, back, and limbs; serious heart difficulty, and prostration.

Prognosis.—In young and healthy adults the termination is almost invariably favorable; but in the case of very young patients or very old persons, the disease is more serious. Complications also make the prognosis sometimes very grave.

Treatment.—Rest in bed is the first essential. An eminent authority has said: "He who remains out of bed during an attack of la grippe takes his life in his hands." The diet must be semi-solid. (See page 281.) The utmost care must be taken in disinfecting all the discharges from the body. As the nasal passages are often the seat of the bacillus, care must be taken to burn cloths used as handkerchiefs by the patient. (See page 152.) The bowels must be kept open by ¼ grain doses of calomel every two hours. Hot foot baths and hot tub baths are beneficial in the early appearance of the disease. (See page 251.) The coal tar products have been used in enormous quantities in this disease, but they are to be avoided by reason of the heart's condition. The pain in the back, chest, and limbs may be relieved by:—

Salicine, ...5 grains.
Sulphate of Quinine,.....2 grains.

One such dose to be taken in a capsule every five hours. Hot stupes are of great relief. (See page 234.)

The congested state of the nose and throat is relieved by:—

Compound Tincture of Benzoin.....½ ounce.
Boiling Water,.....1 pint.

Frequently inhale the vapor from this while very hot.
Also:—

Chloride of Ammonium,.....10 grains.
Tincture of Hyoscyamus,.....15 drops.
Syrup of Ipecac,.....5 drops.
Whisky, ...½ dram.
Chloroform Water,.....1½ drams.

Take one such dose in water every three or four hours.

Food must be nutritious and easily digestible during the attack in order to keep up the patient's strength. During convalescence good food and tonics must be supplied to ward off complications.

LOCKJAW OR TETANUS.

An acute, infectious disease marked by such rigidity of the muscles that the jaws are locked and the limbs are set.

Cause.—It is communicated by the entrance of the *Bacillus tetanus* into the system through wounds or abrasions of the skin. It is found in soils of gardens about stables and manure piles. It is most prevalent in the United States in Louisiana, New York, Pennsylvania, Texas, and Ohio, in the order mentioned. The bacillus has been found on the object that causes the wound, although it may come from other contact. The practice of going barefoot is predisposing. Most of the deaths have been Fourth of July celebration accidental deaths caused by wounds from the toy explosive pistols.

Symptoms.—The symptoms are characteristic: the muscles become set and rigid; the lower jaw is immovable by reason of the spasm in the masseter muscles; the muscles of the face contract so as to give the appearance of a horrible laugh (*risus sardonicus*), the body is arched by the contraction of the muscles in the back; temperature ranges from 100° to 106°.

Prognosis.—The deaths are higher in the acute than in the chronic form; in the latter only 50 per cent and in the former 80 per cent. In very severe cases death occurs on the second day, sometimes on the sixth.

Treatment.—Tetanus antitoxin injection is the very first step in the treatment. The wound must be thoroughly washed after cauterizing or excision, if this latter is possible. The wash should be some antiseptic

wash not too strong. (See page 261.) The wound must not be closed during the early stages. It is of the utmost importance that bacilli, if present, be allowed to escape, or be thoroughly washed out. The safest way to treat wounds that may develop tetanus is to cause them to heal by granulation, not by first intention.

As soon as the disease develops, it is important to look after the nourishment of the patient. If the attack is the acute variety this is not so necessary; but in the more chronic form it will be necessary to resort to the extraction of one or more teeth to admit the passage of the stomach feeding tube, or to pass it through the nose. Narcotics and sedatives are used to control the paroxysms.

MALARIA, INTERMITTENT OR REMITTENT FEVER.

An infectious, intermittent or remittent fever, marked by enlargement of the spleen, anæmia, and chills.

Causes.—It is due to a micro-organism, the *Plasmodium malariae*, which gains access to the body through the bite or sting of a mosquito belonging to the genus *anopheles*. Dangerous places in this respect are marshes and low, damp ground that harbor and breed mosquitoes. As the mosquito is of nocturnal habits, the disease is most generally contracted at night.

Symptoms of the Intermittent Type of Malaria.—There are four stages of this form; cold, hot, sweating, and the interval when fever is absent.

Cold Stage.—Severe chill; fever; thirst; headache; nausea and, sometimes, vomiting; lasting not over an hour, when it is followed by the

Hot Stage.—Pulse rapid; fever increases; skin red and hot; thirst; nausea and vomiting, and headache; all symptoms of fever greatly increased. These symptoms last for less than an hour, or sometimes persist for five or six hours. The fever suddenly subsides and and the patient passes into the

Sweating Stage.—The sweat appears first on the forehead and then rapidly spreads over the entire body; headache ceases; the pulse drops to normal; in from one to three hours the patient falls into a refreshing sleep and begins the

Stage of Freedom from all signs of the disease. These attacks may occur daily, every other day, or may appear on two consecutive days and skip the third, or, again, may appear every fourth day.

Prognosis.—Recovery is the general rule, if the patient is treated. Without treatment there is danger of the disease becoming chronic or complicated.

Treatment.—During the cold stage the patient may take hot drinks; warm applications and one or two teaspoonfuls of Hoffman's Anodyne in water may be given.

During the hot stage he may take cooling drinks such as:—

Cream of Tartar,.....1 ounce.
Hot Water,.....1 pint.

Allow it to cool and use liberally as a drink.

Allay the fever by alcohol sponging (page 253).

During the sweating stage, sponge the body with warm water or with alum and hot water in these proportions:—

Alum, ...4 drams.
Alcohol, ...4 drams.
Water, ...1 pint.

Apply with the hand or with a sponge.

During the interval of freedom from symptoms give:—

Calomel,.....4 or 5 grains.
Bicarbonate of Soda,.....4 or 5 grains.

Follow this dose in four or five hours with a saline aperient such as Hunyadi Janos water, Epsom or Glauber's salts.

About four or five hours before the expected return of the attack, give a heavy dose of:—

Sulphate of Quinine,.....10 to 15 grains.

Or a Clark Powder consisting of:—

Sulphate of Quinine,.....10 grains.
Capsicum,.....2 to 4 grains.
Powdered Opium,.....1 grain.

After the fever has been broken up and the paroxysms do not return give:—

Fowler's Solution of Arsenic,.....5 to 10 drops.

in water every four hours for an extended period.

Or:—

Tincture of Chloride of Iron,.....20 drops.

Take in water every four hours.

Or:—

Dried Sulphate of Iron,.....30 grains.
Sulphate of Quinine,.....30 grains.
Arsenious Acid,.....1 grain.
Extract of Gentian,.....40 grains.

Divide into 30 capsules and take one after each meal.

For preventive measures, see page 156.

GLANDERS OR FARCY.

This is a malignant disease occurring in the horse and mule and which man is liable to contract by inoculation or simple contact with the skin. It is a horrible and loathsome disease, and often proves fatal. An animal affected by it should at once be killed and the body buried.

Symptoms.—The chief symptom of its presence in the animal is inflammation of the lining membrane of the nostrils, which becomes ulcerated, and emits a bloody, fetid, sticky, yellowish discharge. Shortly after a person contracts the disease there are febrile symptoms, probably vomiting and diarrhœa; small ulcerating tumors form under the skin in various parts of the body, and the peculiar viscid discharge from the nostrils commences which is characteristic of the disease. Domestic treatment should not be attempted, but a competent physician employed without delay.

SMALLPOX OR VARIOLA.

An acute, epidemic, contagious disease affecting the entire body.

Causes.—It is believed to be due to a parasite called *Cytoryctes vaccinae,* which is of great vitality and persistence. The disease is spread by clothing and the air.

Symptoms.—The incubation period, that is, the time from exposure to the disease until it appears, is from ten to sixteen days. The attack is sudden. There is first a chill; vomiting; intense pains in the head and in the back, the latter running down the legs. The extreme severity of these pains is often enough to excite suspicions that the on-coming disease is smallpox. The fever quickly runs up to 103° and 104° in the first few days. The pulse is rapid, from 100 to 130 beats per minute, but full and strong. The face is red and the eyes bloodshot. Coarse red spots appear during the third day upon the forehead and lips. This eruption is sometimes preceded by a rash very much resembling either that of scarlet fever or of measles. As soon as the true eruption appears the other symptoms abate. The eruption passes through several stages, from the hardness of shot to mature pustules filled with matter surrounded by a red band. On the tenth day, or a day or so later, the pustules begin to dry up and crust over. The odor is powerful and offensive as soon as the scabs or crusts have formed. These latter fall

off from the seventeenth to the twenty-fourth day, leaving the characteristic pit or scar known as "pockmark."

When the pustules run together, the disease is known as Confluent Smallpox, and is a more dangerous form of the disease, as all of the symptoms are aggravated.

When the pustules are blackened by blood in the form of hemorrhage, the disease is known as Malignant or Black Smallpox. Cases of this form are nearly always fatal.

Those who have been vaccinated take the disease in a modified form, of shorter duration, and without fever. This is known as Varioloid.

Prognosis.—In the ordinary form about four out of a hundred die; in the confluent form, fifty out of a hundred; and in the black or malignant form, nearly all die. In the mild type of those who have not been vaccinated, the fatality is from twenty to sixty out of a hundred. Vaccination exerts a positive protective influence against the disease, either preventing it altogether or changing it to varioloid.

Treatment.—Isolation, disinfection, and full preventive measures to be taken as given on page 152. The patient is put to rest in bed in a darkened room, kept at a temperature of about 65°. The diet must be light and easily digestible, consisting of milk, eggs, eggnog, soups, broths, oysters, beef juice, supplied every three hours. Headache is relieved by the ice cap or sinapisms to the head ("Nursing," page 241). The fever at the start may be allayed by 10 grain doses of phenacetine or antipyrine; or by from 5 to 10 grains of acetanilid, or 5 grain doses of antifebrine.

Insomnia and delirium are treated by opium, chloral or trional. Fever is reduced by cold sponge baths (page 252).

The mouth and nose should be syringed with Dobell's solution (page 329). The eyes, which become inflamed, should be washed with a solution of boric acid. The mouth should be washed with an antiseptic solution, both for cleanliness and comfort ("Nursing," page 241).

Itching caused by the eruption may be allayed by the application of Carron Oil, which is equal parts of limewater and olive oil. Or the following ointment may be used:—

Eucalyptol, ... 1 dram.
Carbolized Vaseline, ... 1 ounce.

Apply lightly to the pustules with a feather. Hot water dressings are also grateful. These washes and oils, in addition to allaying the itching, also in a measure prevent pitting.

See "Vaccination."

TYPHOID OR ENTERIC FEVER.

An acute, infectious fever, in which the lower intestine, the spleen, and the mesenteric glands are chiefly involved.

Causes.—It is caused by infection from the bacillus typhosus of Eberth, the discoverer. This is taken into the body in food, such as drinking water, milk, ice, oysters, etc. The bacillus excites a catarrhal inflammation of the lining of the intestine, which later ulcerates and sometimes causes perforation of the bowel. The disease passes through a period of incubation which varies from one to three weeks.

Symptoms.—The disease begins with a feeling of general illness and it is usually some days before any well-marked symptoms appear. Among the earliest are an aching in the forehead, pain in the back and limbs. There is a state of mental dullness, and sometimes a slight deafness. At first the tongue is coated, but very soon the edges become clean and red, while the coating in the middle persists. During the first week the headache increases and is accompanied by sleeplessness and thirst. A mild degree of fever is noticeable, and there are often repeated attacks of nosebleed. The bowels are generally constipated during the first week, but sometimes diarrhœa sets in early, and the stools are the characteristic pea-soup stools of the disease. Meanwhile the temperature climbs up day by day, until, at the end of the first week, it is from 102° to 104°, being higher at night than in the morning. The pulse gains as the fever rises, and at the end of the first week it is from 90 to 100 beats per minute. Between the seventh and the ninth day there appear on the abdomen from five to thirty red spots which disappear on pressure. These come in crops and remain for from three to five days, when they are followed by another group. The tongue is dry and shows cracks on the surface. Diarrhœa is profuse, and at the end of the second week the fever has reached the crisis. If the attack is severe the patient is delirious, marked by muttering, the teeth and lips are covered with crusts or coatings called sordes. During the third week the symptoms continue and become intensified. The skin is dry and harsh and the patient shows great emaciation. Improvement is looked for at any time between the fourteenth and twenty-eighth days, according to the severity of the attack. During convalescence the patient emerges from the attack thin, feeble and hungry.

Prognosis.—While upon the whole this is favorable in the total number of cases, it is hard to give an accurate prognosis in any particular case. So much depends upon whether the patient has gone to bed early

in the attack and conserved his energy to withstand it. The degree of absorption of poisonous matter during the course of the disease, and the chances of perforation of the bowel, are also large factors, to say nothing of the many complications which may arise. Among these latter are ulceration of the entire gastro-intestinal tract, or of parts of it, hemorrhage from the bowel, pneumonia, meningitis, and paralysis. A sudden drop in the temperature to normal is a grave symptom, and suggests perforation. Still coma, where the patient is apparently awake but takes no notice of his surroundings, is also serious. Then there is always the very great possibility of a relapse.

Treatment—If the patient is put to bed early in the attack his chances are greatly improved. Rest, tranquillity of mind and body, mean much as a fortification against the long period of emaciating and enervating fever. That form of the disease popularly known as "walking typhoid," while mild in the demonstration of symptoms, is very frequently the most pernicious by reason of the grave complications which so often cause a fatal termination of it. There is probably no other disease which demands and so well repays good nursing as does typhoid. Thorough nursing and exact and persistent preventive measures are half the battle. All of the preventive means as laid down on page 152 must be rigidly used.

Half hour doses of one quarter grain of calomel should be given until one or two grains have been given or until the bowels move. This is followed by some such mild saline aperient as Hunyadi Janos water, Epsom or Glauber salts. Throughout the course of the disease give:—

Dilute Hydrochloric Acid,.....5 to 10 drops.
Essence of Pepsin,.....1 teaspoonful.

Give one such dose every six hours after eating.

The fever is to be reduced by the cold rub, cold sponge bath, cold pack, or Brand's cold plunge bath. Full directions for the administration of these for reduction of fever are to be found on page 231.

The diet is absolutely a liquid diet for the first and often for the greater part of the second week. The patient takes from one to one and a half quarts of milk in the twenty-four hours in small quantities every two or three hours. If the stools show curds, too much milk is being given and it must then be diluted with limewater or Vichy. The milk may be peptonized to render it more easily digestible. (See page 288.) Towards the last of the second week the patient may take soft boiled eggs, little more than warmed through so that they may be drunk from a glass. Or the eggs may be beaten and strained. Mixed with milk they may

be rendered more palatable by flavoring with vanilla, lemon juice, etc. Among the broths that may be given, chicken is, perhaps, the best. If there is a tendency to diarrhœa after the broth, it is probably due to the fat in it. To correct this, set the broth to cool, when the fat will rise and form on the top; it may be skimmed off, and the broth warmed over. In constipation, the fat, of course, should be given with the broth. Gruels from rice, cornstarch, barley well-cooked may now be added to the list, but they may be a little difficult to digest. This may be overcome by the addition of a little taka-diastase to them.

There is no objection to giving the patient small quantities of cool, but not iced, water when he craves it to allay thirst. The mouth is to be washed and swabbed frequently with listerine, glyco-thymoline, or boric acid solution. (See "Nursing," page 254.) If prostration be indicated by weakened heart action or slow pulse, whisky or brandy may be given in half-ounce doses every three hours in the milk to promote digestion.

The use of the bath to reduce temperature is intended to take the place of antipyrine and the other fever agents, not to be taken along with them. The cold method is sufficient, and the drugs only increase the already great exhaustion.

Diarrhœa is not to be checked unless the stools exceed more than three in the twenty-four hours. For this purpose give:—

Subnitrate of Bismuth,.....20 grains.
Carbolic Acid,.....1 drop.
Paregoric,.....15 drops.
Tincture of Deodorized Opium,.....8 drops.
Mucilage of Acacia,.....1 dram.
Water,.....3 drams.

Give one such dose every three or four hours.

Constipation may be best treated by enemas. (See "Nursing," page 254.)

Accumulation of gas in the intestines and the abdomen, called tympanites, is relieved by cold compresses, ice bag, or turpentine stupes to the abdomen. (See "Nursing," page 254.)

Headache is treated with ice bag to the head, and if necessary:—

Bromide of Soda,.....10 grains.

Take one such dose every two or three hours.

Insomnia is often relieved by a glass of hot milk, or one ounce of whisky in water.

Delirium is largely prevented or lessened by keeping up the strength.

TYPHUS FEVER.

Typhus fever is a kind of contagious fever, characterized by the ordinary symptoms of other fevers, accompanied with debility in the nervous and vascular systems, and a tendency to putrefaction.

Causes.—The cause of typhus is contagion, the activity of which is much increased by the crowding of human beings into close, ill-ventilated and filthy places with insufficient nutriment, and other causes which tend to depress the vital power. It is eminently contagious and infectious, and often prevails epidemically in jails, on shipboard, and in famine-stricken regions.

Symptoms.—The symptoms are great prostration of strength, high fever, weak and irregular pulse, nausea, vomiting, flushed countenance. parched and furred tongue, and excessive thirst. In the worst cases black or purple spots appear on the skin; there is a peculiar fetid smell, and sometimes there are discharges of blood. The duration of this fever is uncertain: sometimes it terminates between the seventh and fourteenth day, and sometimes it is prolonged five or six weeks. Its duration depends greatly upon the constitution of the patient, and the manner of treating the disease. The most favorable symptom is a warm sweat after the fourth or fifth day. This will continue some time and carry off the fever. Eruptions about the mouth and nose may be regarded as favorable.

Prognosis.—The unfavorable symptoms are excessive looseness of the bowels, with a hard, swelled abdomen, black or livid blotches breaking out on the skin, sore mouth, cold, clammy sweat, change of voice, inability to put out the tongue, a constant inclination to uncover the breast, difficulty of swallowing, sweat, and sputum tinged with blood, and the urine black, or depositing a black sediment; such symptoms indicate death.

Treatment.—In the early stages of this disease it is best not to interfere much with nature. The principal aim ought to be to keep up the patient's strength until the fever poison has expended itself. When seen early, however, it is often of advantage to administer an emetic; and the patient's uneasy sensations will be much soothed by sponging the surface of the body with cold or tepid water. When the powers of life begin to fail, a stimulating course of treatment should be commenced,—such as strong beef or chicken tea, with wine or brandy frequently administered, taking care that it does not aggravate the febrile symptoms.

When there is much general irritability and sleeplessness, a dose of opium may be given. The patient should be in a large, well aired apartment, and the windows kept open as much as possible. As the patient begins to recover, a course of tonics will be necessary to expedite his restoration to health. The attendants usually contract this fever.

For preventive and disinfecting means, see **page 155.**

YELLOW FEVER.

An acute, infectious fever occurring in three stages—the febrile, the interval or remission, and the collapse. It occurs most frequently in June, July, August, and September. The regions most affected are the tropics in certain well defined areas, from which it is never absent. Natives and negroes within those areas are, to a greater or less extent, immune, but strangers are very susceptible. Cases occur in other parts of the world, many of them being carried by ships. Seaport towns are most likely to have such cases.

Cause.—It is communicated by a micro-organism, the *Bacillus icteroides,* which is carried and transmitted in the bite of a mosquito, the *Stegyomia fasciata.*

Symptoms.—It usually breaks out after from one to six days after exposure to the infection. The symptoms of the first or febrile stage are: general illness and weakness; headache; chill; high fever, running up to 104° or 106°; pains in the back, head, and limbs; pulse is rapid; face flushed; stomach nauseated; eyes bright. One of the most marked peculiarities of the symptoms is the action of the pulse, which mounts up at first as the fever rises and then suddenly shows a tendency to fall. The urine is high-colored and scanty; the bowels are constipated; and the patient emits a peculiar odor from the body. This stage lasts for from one and one half to three or four days.

The second stage, or the interval, is marked by a fall in the temperature to about 99° or 100°, with a general lessening in the severity of the symptoms. Recovery may take place at this stage. If not, it lasts for from a few hours to four days, when the third stage begins.

The symptoms of the period of collapse are: a return of all the symptoms with greater violence; jaundice; black or "coffee-ground" vomit; hemorrhages from the bowels and mucous membranes generally; weak pulse; cold skin; irregular breathing; and death from exhaustion without loss of consciousness.

Prognosis.—Fatality runs from 15 to 85 per cent. Unfavorable symptoms are black vomit, suppression of urine, high fever, and collapse.

Treatment.—Rest in bed; mild laxatives such as castor oil, citrate of magnesia, and calomel in the early or first stage; in the early stages the diet must be confined to milk, sago, and arrowroot, and similar bland articles. As the disease advances, the strength should be kept up with broths made from lean meat, and thickened with bread crumbs, oatmeal or barley. Strict cleanliness must be observed about the patient and the bed linen. Good nursing is of great importance. If the stomach is very irritable and the vomiting excessive, give:—

Powdered Rhubarb,.....20 grains.
Bicarbonate of Soda,.....20 grains.
Powdered Peppermint Leaves,.....1 teaspoonful.
Laudanum, ...15 drops.
Brandy, ...1 tablespoonful.
Boiling Water,.....1 gill.

Mix. Sweeten with loaf sugar and give a tablespoonful every hour.

The patient should be supported by stimulants such as alcohol, strychnine, etc.

ASIATIC CHOLERA.

The Asiatic, malignant, or pestilential cholera is a very violent form of disease. It commonly comes on without any warning in one whose previous health has been apparently sound. Or it may be preceded by acute diarrhœa, with nausea and vomiting.

Causes.—An acute specific germ infection, the particular germ being the *Comma bacillus*. The cholera stools transmit the infection.

Symptoms.—There are three stages: the first stage is the stage of invasion, in which there are symptoms of mild diarrhœa, colic, general weakness, some chilliness, headache, and sometimes nausea and vomiting. The second stage: the diarrhœa increases, the discharge is thin, colorless, and like rice water. Vomiting is more constant, there is great prostration, the skin is cold and clammy although the temperature may be quite high, the features are pinched, urine is scanty, the pulse almost imperceptible, the eyes sunken and surrounded by a dark circle; the patient sinks into a state of apathy, and, unless a favorable change speedily takes place, he soon expires. This stage may last from a few to forty-eight hours.

Third stage or stage of reaction: when reaction does take place, the pulse gradually returns, the natural warmth of the body is restored, the urine is more copious, the vomiting stops, fever and diarrhœa

gradually subside. Frequently, however, the reaction is accompanied by fever of a typhoid type, which prolongs convalescence or terminates fatally in from four to eight days.

Treatment.—Put the patient at rest in bed, withhold food for a few hours, quench the thirst by allowing the patient to suck pellets of ice. Give large doses of calomel, three to five grains every two hours for three or four doses. Follow with a dose of castor oil, wash out the bowels with two or three gallons of hot water to which is added common salt, one level teaspoonful to the quart. This should be done twice daily.

For the diarrhœa nothing succeeds better than the following, according to the late Roberts Bartholow:—

Deodorized Tincture of Opium,.....3 drams.
Aromatic Sulphuric Acid,.....5 drams.

Mix. Give ten to twenty-five drops every hour or two in one or two tablespoonfuls of water.

Vomiting is best controlled by use of:—

Carbolic Acid,.....4 grains.
Bismuth Subnitrate,.....2 drams.
Glycerine,.....3 drams.
Peppermint Water,.....to make 3 ounces.

Mix. Give a tablespoonful every two hours until relieved. Hot applications over the bowels are also beneficial; the body heat should be kept up by means of hot water bottles externally and hot coffee by the rectum. Nutritious diet is required.

The following has been very effectual in curing severe cases of virulent cholera:—

Tincture of Opium, Tincture of Camphor,
and Spirits of Turpentine, of each,....3 drams.
Oil of Peppermint,.....30 drops.

Mix. Dose, one teaspoonful in brandy and water, for the mild form of cholera; and one tablespoonful for the more virulent.

As a preventive the following may be taken in cholera times:—

Bicarbonate of Soda,.....1 scruple.
Ginger,.....8 grains.

Take in a glass of water, after breakfast and supper.

GENERAL DISEASES OF ADULTS

ANEURISM.

A sac of blood formed by the expansion within defined limits of the coats of an artery. There are aneurism of the arch of the aorta, of the thoracic aorta, and of the abdominal aorta.

Causes.—A weakening of the coats or walls of an artery; exertion; the break-up of the tissues in old age; alcoholism; syphilis; diabetes; malaria; gout; rheumatism; Bright's disease; exposure and excesses of various kinds.

Symptoms.—An elastic, pulsating tumor may be felt in the region affected; auscultation reveals an aneurismal murmur; deep-seated pain in the thorax or part affected; paralysis from pressure on the nerves; difficulty in breathing and in speaking are often noted; pupils may be contracted or dilated; sometimes a cough is present; loss of flesh; anxious expression, and sometimes gastric disturbance. These symptoms vary according to the location of the aneurism.

Prognosis.—The prognosis is unfavorable. The average duration of life after the formation of an aneurism is from one to four years. Death may come suddenly as a result of over-exertion or anger, when the result is a hemorrhage; or it may result from gradual exhaustion.

Treatment.—Tuffell's treatment consists of absolute rest of mind and body, including rest in bed, starvation diet (see page 278) for three months at least. Potassium iodide is administered in gradually increasing doses to the limit. The object of the treatment is to cause the blood in the sac to coagulate and to prevent rupture. Surgical treatment consists in the tying of the artery (when small) on both sides of the aneurism; puncture and galvanic treatment are also used with more or less success.

APOPLEXY, CEREBRAL HEMORRHAGE, EMBOLISM OR THROMBOSIS.

A stroke characterized by paralysis and sudden insensibility.

Causes.—This may be due to cerebral hemorrhage, a bursting of a blood vessel in the brain; the escaping blood presses upon the brain and causes an injury to the tissues, which results in paralysis. This is the

most common type of apoplexy and seldom occurs before the fortieth year, but most frequent in men between the fortieth and the eightieth year. The bursting of the blood vessel is often the result of: heredity, Bright's disease, gout, rheumatism, chronic alcoholism, syphilis, and diseases of the heart and the arteries. Immediate causes of the rupture are: acute indigestion, violent physical exertion, fits of rage, and excesses of any kind.

Symptoms of Cerebral Hemorrhage.—The presence of a ruptured blood vessel in the brain is usually first announced by dizziness; pain in the head; numbness of legs and arms; nosebleed, and fear of falling. The attack or stroke may come rather slowly, preceded by vomiting; or may come suddenly with coma, insensibility, and, if standing at the time, the sufferer falls to the ground with the muscles relaxed; breathing is irregular, slow, and noisy, the noise being caused by paralysis of one cheek, which flaps in and out with the breathing; pulse is full and slow, and there is throbbing of the large carotid blood vessels (in the neck). The face is very red; the pupils of the eyes either contracted or dilated, but not influenced in size by the action of a light placed before them. There is always more less fever.

Prognosis.—The attack usually lasts for from one-half an hour to five or six hours. If it extends to more than twenty-four hours, with insensibility, the termination will probably be fatal. Generally the effects are felt for several weeks, the mind then clears up, the headache ceases, there may be partial or full recovery from the paralysis, and this condition may last for some years. But there is always danger of another attack with increasing probability of a fatal termination.

Symptoms of Thrombosis.—These come on gradually and are persistent. There are drowsiness; headache; dizziness; loss of consciousness; paralysis of at least one side of the face; later, paralysis of the arm, and one by one the other parts, until, within twenty-four or thirty-six hours from the time of the first symptoms, there is paralysis of the entire one half of the body. The paralysis may develop without loss of consciousness. The mental impairment is greater than in cerebral hemorrhage. The patient is profoundly emotional, weeping and sighing frequently.

Prognosis of Thrombosis.—While there is frequently some improvement in the paralytic condition, the case eventually proceeds, perhaps years after the attack, to softening of the brain and general paralysis; and the patient dies either in a comatose state or in convulsions.

Symptoms of Embolism.—This condition develops suddenly, with twitching of the muscles, dizziness, more or less mental confusion, headache, loss of consciousness, paralysis of one side of the body, usually the right side.

Prognosis of Embolism.—After some weeks there may be a complete recovery. This is characteristic of the mild cases in which the symptoms are less grave in nature. In the serious form, death may result in a day or two from plugging of the large blood vessel. This state is to be feared when the insensibility lasts for a long time—twenty-four hours or more. The patient may regain consciousness; but passes through progressive stages of dementia, softening of the brain, and aphasia (the inability to remember words). Death finally ensues from exhaustion.

Treatment.—If there are warnings of the approach, the efforts are directed towards reducing the pressure of the blood on the vessels of the brain. This is done by bloodletting and a brisk purgative such as:—

Epsom Salts,.....2 ounces.
Glycerine, ...1 ounce.
Boiling Water,.....3 ounces.

Give with great care as an enema.

Leeches may be applied to the mastoid process (the large eminence behind the ear).

If the attack is sudden, at once loosen the clothing around the neck and throat so that the blood vessels are not restricted. Place the patient in a cool, quiet room. Let him lie rather on his side, with face turned a little downward to prevent the tongue from falling back and obstructing the breathing. Slightly raise the head and shoulders. Apply an ice bag to the head. Bloodletting should quickly follow to relieve the brain pressure, and a cathartic is to be given. In insensibility this is best given in the form of:—

Croton Oil,.....1 to 3 drops.
Glycerine, ...15 drops.

Place this with a medicine dropper well back near the root of the tongue to insure that it will be swallowed.

If, during the attack, the face becomes very pale and the pulse irregular, give stimulants such as

Aromatic Spirits of Ammonia,.....½ teaspoonful

in water very cautiously.

The fever may be reduced by an alcohol sponging (page 253).

The blood clot formed in the brain must not be absorbed too quickly, lest hemorrhage ensue. For this purpose give:—

Solution of Arsenite of Potash,.....5 drops.
Syrup of Lacto-phosphate of Lime,.....2 drams.

One such dose three times a day.

The diet must be liquid or semiliquid (page 278) The patient must be kept scrupulously clean, his wants must be inquired into, if power of speech is wanting or impaired, and every attention paid to him in his helpless condition.

Electric treatment is beneficial for paralysis. Massage and warm salt baths are effective (page 270).

In Embolism and Thrombosis, rest, and the same position as directed in cerebral hemorrhage. Place ice to the head for relief of headache and control of hemorrhage or inflammation. To promote absorption of the blood and to re-establish circulation give:—

Ammonium Carbonate,.....3 drams.
Ammonium Iodide,.....3 drams.
Solution of Ammonium Acetate,.....4 ounces.

Give one teaspoonful in half a glass of water three or four times a day. This is to be continued for a long period.

If syphilis is determined as the cause of the disease, remedies such as iodide of potassium or of soda and mercury are to be given under the careful guidance of the attending physician.

EPILEPSY.

Epilepsy is a form of disease which receives its name from the suddenness of its attack. It is also called the *falling sickness,* because the patient, if standing, suddenly falls when an attack comes on. By the ancients it was called the sacred disease, from being supposed to be due to the influence of the gods or evil spirits.

Causes.—Among the causes which give rise to epilepsy are external injuries done to the brain by blows, wounds, fractures, and the like; or pressure from water on the brain, and tumors. Violent affections of the nervous system, sudden frights, strong mental emotions, acute pains in any part, worms in the stomach or intestines, teething, suppression of

the menses, excesses and masturbation, are causes which also produce epilepsy. Sometimes it is hereditary.

Prognosis.—When it arises from hereditary predisposition, or comes on after the age of puberty, or when the attacks are frequent and of long duration, it is usually difficult to effect a cure; but when it occurs in early life, or is occasioned by worms or any other accidental cause, it may be remedied.

Symptoms.—The attack is usually without warning. The patient may be in his ordinary health, engaged, perhaps, in his usual occupation, when all at once he utters a piercing scream, and falls to the ground. Immediately thereafter the face becomes violently distorted, the head is usually drawn to one side, the eyes are set and staring, or roll wildly about, the color of the skin becomes dark and livid, and the veins swollen and turgid; there is frothing at the mouth; the muscles of the lower jaw act violently, producing gnashing of teeth, and frequently the tongue is injured; the arms are sometimes thrown violently about, and the lower limbs may be agitated in a similar manner, while the fingers with great power clutch at whatever comes in their way. The breathing is at first heavy and difficult, but afterwards it becomes short, quick, and stertorous, and is often accompanied with sighing and moaning. One side of the body is commonly more agitated than the other. After a longer or shorter period, the convulsive movements gradually diminish, and the patient seems to recover a faint glimmering of consciousness; but the look which he casts around is stupid and heavy, and he goes off into a lethargic sleep, from which he does not awake for some hours. There is no consciousness of anything that occurred during the paroxysm. On coming out of the fit, there is generally headache and always languor, and it may be days before he fully recovers from the effects of the attack. The duration of the paroxysm is usually from five to ten minutes; but sometimes several attacks follow one another in succession, and it may be then protracted for several hours. The most frequent, perhaps, of the consequences of confirmed epilepsy is insanity, either in the form of acute mania or monomania following the attacks, or of gradual imbecility, without any acute seizure. Though the fit usually comes on suddenly, yet there is sometimes distinct warning of its approach. It varies in different individuals, and may be lowness of spirits, irritability, dizziness, noises in the ear, floating specks before the eyes. There is, however, a particular sensation which is said to be felt by some immediately before the attack, and which is known as the *aura epileptica*. It is variously

described as resembling a current of air, a stream of water, or a slight convulsive tremor, commencing in one of the limbs, and proceeding upwards to the head, when the patient is deprived of all consciousness. Epilepsy is commonly divided into idiopathic, when it is a primary disease, depending on some affection of the cerebro-spinal system; and sympathetic, when produced by an affection in some other part of the body—as the stomach, bowels, liver, circulating system, etc.

Treatment.—During the attack, the principal thing is to see that the patient does no self-injury—especially a piece of cork ought to be placed between the teeth, to prevent injury to the tongue; the dress should be loosened about the neck and chest; the head, if possible, a little raised; and a free circulation of air maintained. Where the disease can be traced to any special exciting causes—as injuries of the head, worms, teething, etc.,—the treatment should first be directed to its removal. When a plethoric state appears to occasion the disease, the patient's diet is to be restricted, frequent purgatives are to be administered, and everything avoided that may determine the blood to the head. If there are marks of debility, a generous diet, with tonic medicines and other means of strengthening the system, will be proper. The cold shower bath is recommended if it can be well borne, otherwise the tepid bath. The oil of turpentine, in frequent doses of one-half to one dram, is said to be of service in many cases. Bromide of potassium is a very valuable remedy, given in doses of ten to twenty grains three times a day. Stimulants, particularly ether, are said occasionally to keep off an attack. In this disease great care is necessary in the matter of diet, and moderation in quantity and quality are material points. When the appropriate remedies are judiciously employed, and the proper regimen strictly adhered to, epilepsy is often permanently cured, and the suffering is greatly mitigated even in those forms which do not admit of cure.

Eclectic Treatment for Epilepsy.—Observe the same general treatment as before recommended. Give an emetic. The following is a good one:—

Pulverized Lobelia,.... .....1 ounce.
Pulverized Bloodroot,.. .....½ ounce.
Seneca, ...1 scruple.
Ipecac, ...6 drams.
Cayenne, ...4 scruples.

Mix. Dose, half a teaspoonful in warm water; repeat three or four times, at intervals of fifteen minutes.

Bathe the feet and legs in warm water; apply mustard poultices to the nape of the neck; keep the bowels open; and remove all tight bandages, and give plenty of fresh air. An excellent preparation is the following:—

Peony, ...1 ounce.
Peruvian Bark, ...1 ounce.
Valerian, ...1 ounce.
Snakeroot, ...½ ounce.

Simmer them together in two quarts of water till reduced to one; add one pound of sugar. Give the patient from one-half to a wineglassful three times a day.

On the approach of a fit, give a teaspoonful of fine salt three times a day; it will shorten the patient's sufferings. A person liable to this affliction should exercise the greatest caution in regulating the passions.

CONCUSSION OR INFLAMMATION OF THE BRAIN.

The result of a shock, blow, or other injury upon the brain without any outward appearance of a wound.

Causes.—This is nearly always produced by a blow or a fall; it is one of the most frequent injuries to which the brain is exposed; it may be either slight or severe, in proportion to the severity of the exciting cause; in the former case the effect is but momentary—the patient is stunned, but very soon recovers consciousness, and perhaps feels no more of it, except a little tenderness of the part struck. It should be borne in mind that concussion of the brain is not always the result of a blow; it may be produced by a violent shock to the nervous system, such as that caused by coming down heavily on the feet from a leap.

Symptoms.—Among the symptoms of inflammation of the brain, or its investing tissues, may be mentioned as prominent: Shivering, succeeded by heat in the skin; great thirst; tongue furred; pain in the head; intolerance of light; bloodshot eyes, with a wild, wandering look; sickness, and delirium. There may be violent and obstinate vomiting, as a first symptom, followed after a time by others. In the latter case he remains unconscious, without the power to move or speak; the pulse is slow and feeble, the breathing difficult, frequently there is vomiting, and an unnatural contraction or dilation of the pupils of the eyes.

Prognosis.—If it is simple concussion, a fatal termination is not likely; but sometimes the shock causes rupture of the substance of the brain itself, or its inclosing membranes, or of one or more of its blood vessels, causing effusion; in this case the patient may never rally from his state of stupor, or, if he does, it will be but for a short time; there will probably be convulsions, paralysis, and other symptoms resembling apoplexy. All these are characteristic of inflammation. In so sensitive an organ as the brain, it must be evident that an inflamed state of the tissues is by all means to be avoided; hence, when reaction sets in after the stunning and depressing effects of concussion have passed off, keep the head cool and the patient quiet.

Treatment.—In this case but little can be done beyond putting the patient to bed, and keeping the surface of the skin warm by friction and hot applications; when there is extreme depression, a little brandy or sal volatile may be given, but very sparingly, because, if death does not ensue, there will be reaction, with an inflamed state of the organ. If a physician is not within reach, and the alarming symptoms increase in intensity, the hair of the head should be cut or shaved off, and towels wet with cold water applied; if iced, so much the better. A thorough cathartic should be given. To reduce the pulse and cause perspiration, give four drops of tincture of veratrum, in a little sweetened water, every hour, till the desired results are produced.

INFLAMMATION OF THE OUTER COVERING OF THE BRAIN OR PACHYMENINGITIS.

Causes.—Fracture of the skull; necrosis (death) of the bones of the head; penetrating wounds in the head; chronic alcoholism; Bright's disease; syphilis; erysipelas, and tuberculosis.

Symptoms.—These are always obscure and the diagnosis is often extremely difficult. Dizziness; headache; sensitiveness of the eyes to light; delirium; convulsions; coma; apoplectic strokes; epileptic fits, and paralysis, are among the most frequent indications of this condition.

Prognosis.—Death usually terminates the condition.

Treatment.—This is purely symptomatic and must be adapted to the conditions as they arise. Surgical attention, especially trephining, offers hope of a favorable ending in some cases, especially those caused by wounds of the head.

ACUTE MENINGITIS, CEREBRAL OR BRAIN FEVER.

Inflammation of the inner and middle coverings of the brain, with an exudation from the blood vessels. It is most frequent in young persons and in males.

Causes.—Infectious fevers; erysipelas; typhoid fever; influenza; pneumonia; diphtheria; disease of the middle ear, and of the bones of the head; abscess of the brain; overwork; insomnia of long duration; acute alcoholism; sunstroke; syphilis, and a micro-organism.

Symptoms.—Headache; general irritability; weakness; dizziness; vomiting; constipation; fever, and coated tongue. Then follows the stage of invasion. The fever rises to from 103° to 104°; pulse from 100 to 120; face, flushed; eyes, congested; headache, intense and continuous; ringing in the ears; intense sensitiveness to light; delirium, and intense sensitiveness of the skin.

The second stage, or period of excitement, lasts for from one to fourteen days, and is marked by an increase of all symptoms; rolling of the eyes; delirium amounting almost to mania; twitching of the muscles of the face; bending back the head; arching the body backward, and occasional outcry. Drawing the finger nail across the abdomen leaves a red line characteristic of this disease.

The third stage, or stage of depression or collapse, follows. It is marked by paralysis; the patient becomes quiet; delirium and muscular contortion subside; sleepiness; coma; fever abates; pulse, slow and irregular; the sphincter muscles relax and the urine and the fæces are voided involuntarily, and the breathing is jerky.

Prognosis.—Death usually follows on the first or second day of the third stage. Should a patient survive he is usually less mentally bright, and is likely to suffer much from headache and epilepsy.

Treatment.—Absolute rest in bed in a dark and well-ventilated room. The head elevated and ice applied to it. Only liquid food is given. When the patient is unconscious, or unable to swallow, it must be given by the rectum (page 235). Delirium and convulsions are controlled by narcotics administered by the physician. Vomiting is relieved by doses of chloral. The fever and high temperature are controlled by sponge baths and rubs (see page 253). Leeches or fly-blisters behind the ears, at the back of the neck, and on the temples are of service in relieving the blood flow to the brain. Venesection (bloodletting) is often resorted to.

NERVOUS PROSTRATION OR NEURASTHENIA.

A condition of nerve-tire or exhaustion attended by an inability or lack of desire to attend to ordinary work and duties.

Causes.—Excessive nervous and mental strain; overwork; emotion; alcohol; tobacco; combined fatigue and mental anxiety; nervous temperament and heredity.

Symptoms.—Irritability of temper; mental weakness; inability to concentrate the attention; attempts to engage the mind are attended by headache, dizziness, restlessness, fear, depression of spirits, and physical weariness. There are a persistent feeling of pressure on the head; disturbance of sleep, either insomnia or unrestful slumber; pain in the back; dyspepsia, and mental disorders.

Prognosis.—If the unfavorable conditions which have brought about the condition can be removed, the outlook is favorable; but the cure may take a very long time, and the patient is usually in some measure permanently affected by the attack.

Treatment.—The "rest cure" as first suggested by Dr. S. Weir Mitchell is the only rational and curative treatment that can be given. The efforts must be directed to restore to the patient the loss of nervous energy to which his condition is due. It is almost hopeless to attempt to give the required degree of rest and upbuilding at home. A sanitarium or hospital must be chosen and the patient submit himself to the discipline of his attendants. But if home conditions are very good, and the patient can have a trained or otherwise competent nurse to devote entire time and attention to his welfare, a cure can be effected. The patient is not allowed to sit up, but must have perfect physical and mental rest in bed. He must not receive or write letters nor read, for this is using up the nervous and muscular energy which is sought to be restored. Lack of exercise is to be made up by daily massage. Electric treatment once a day is also beneficial. This is to be supplemented by bathing (see page 251). The food is to be nourishing and easily digested. It is best given in small quantities at intervals of about three hours.

An excellent tonic for this condition is:—

Fluid Extract of Coca,	2 drams.
Dilute Phosphoric Acid,	6 drams.
Tincture of Nux Vomica	1 dram.
Syrup of Ginger,	1½ ounces.
Peppermint Water to make	6 ounces.

Take a tablespoonful in water after each meal.

LOCOMOTOR ATAXIA.

A disease causing degeneration of the spinal cord and nerve roots, resulting in loss of control of the muscles.

Causes.—Syphilis; alcoholism; exposure; and wounds or injuries are the principal, direct or indirect, causes of the disease.

Symptoms.—There are three stages of the disease: 1. Loss of sensation; 2. Inability to direct or control motion; 3. Paralysis. The attack comes on very gradually, and among the first indications are sharp, darting pains in the legs and feet; loss of feeling in the feet, such as the inability to distinguish between hard and soft substances stepped on; if the spinal cord is affected in the upper part there is difficulty in operating several sets of muscles in the fingers at the same time, such as are demanded in the act of buttoning the clothing. A tingling or burning is felt on the surface of the body in the waist, legs, feet, knees, and ankles. There is also a tightened feeling around the waist as though a belt were tightly strapped about it. The inability to operate more than one set of muscles at a time is called lack of coördination, and is noticeable in an attempt to walk in a straight line. This test is usually applied in the early stages by directing the patient to try to do so with the eyes closed. The patient is also asked to stand with the feet close together and to close the eyes; if the disease is begun he will have great difficulty in standing erect in such a position, but will sway about and perhaps fall. There is no loss of power in the muscles but simply an inability to control the movements of the limb. The optic nerve is affected early in the progress of the disease, and the sight is affected in the direction of color-blindness or in double vision. These symptoms become more and more pronounced as the disease advances, especially in the way of loss of sensation, until the patient is unable to feel a pin prick in the feet. There is also considerable emaciation; ulcers on the feet; loss of hair; and sensations of pain in many parts of the body, caused by certain organs becoming affected by the progress of the disease. There may be griping pains and vomiting; pain in urinating; pain in the rectum, with hemorrhoids; spasms of coughing; difficulty in breathing and constriction of the pharynx; and pains in the region of the heart. The disease leads up ultimately to paralysis, and in rare cases is attended by loss of mental power.

Prognosis.—The outlook is unfavorable; the disease may extend

over a period of several years; there may be times when recovery seems possible; but the termination is death.

Treatment.—Absolute rest in bed; excitement, mental distress and worry, and excesses are to be avoided; and the treatment should be directed towards the improvement of the general health. To this end the diet must be nutritious, and cod-liver oil, hypophosphites, and strychnine are to be given. If syphilis is the cause, that is to receive its special form of treatment. Massage and clearly defined forms of exercise are of benefit. Frankel's system of exercises aims to teach the patient the control of his muscles all over again as though this had been forgotten. This is the correction of the lack of coördination of muscles. There are many varieties of exercises which will produce great benefit. Among others a plank is arranged with a number of cup-like hollows placed along its length at intervals and numbered; this is placed at the foot of the bed and the patient is directed by the nurse to place his heel in such and such a number. A chalk line is drawn along the floor and he is required to walk as nearly along it as he can. A small flight of stairs is used with a railing on each side for support; the patient walks up one or two steps and down on the other side by using his legs without assistance from his hands. These and many other ingenious forms are followed, not to an exhausting degree; and while they are not curative of the disease, they teach control of the movements, and in conjunction with massage they keep up the muscular tone of the limbs and encourage the patient. Baths, both plain and medicated, are of great service; but the cold bath should be employed only when the vitality is great enough to recover from its stimulating effects. Electricity in some of its several forms of applications is also of benefit in many cases. Certain mechanical devices have been employed in the form or harness by which the strain was removed and transferred, but they are not now used.

PALSY OR PARALYSIS.

The total loss or diminution of motion or sensation, or both, in any part. There are several kinds of palsy or paralysis, such as the *paralysis agitans,* the shaking, or, as it is sometimes called, from the peculiarity of the patient's gait, the dancing palsy; *hemiplegia,* when one side of the body only is smitten; and *paraplegia,* when it is the lower half which is more or less deprived of its nervous power; but in all cases it is the brain which is the seat of disorder; and if this is confined to one of its

hemispheres, the attack, if it does not include both sides, is most likely to fall on the opposite side of the body.

Causes.—The rupture of a vessel of the brain is one of the most common causes of paralysis, and this may occur without there being any decided apoplectic symptoms. A slight transient faintness, and confusion of ideas, may precede the attack, or it may come on during sleep, so that the patient may only be made aware that he is paralyzed by his inability to speak plainly, or to move a limb, or one side of his body. Sometimes the attack is gradual, and occupies a considerable time,—days, weeks, and even months elapse before the loss of nervous energy becomes complete; and this helplessness may be produced by a succession of slight shocks, as it were, or by the gradual stealing on of an apparently torpid condition. This latter is more commonly the case when the disease arises from a decided state of general debility, which in time involves the brain, until the structure gives way and softening is the consequence. Hard drinkers, and others whose lives or habits necessitate a frequent state of cerebral excitement, are liable to this disease. With such the progress of the disease is generally rapid.

One of the chief causes is pressure upon or disease of the brain or spinal cord. When confined to the lower part of the body, there may be reason to believe that the defect of power is in some cases but functional. In this case the cause may be long exposure of the lower limbs to wet and cold, self-abuse, excessive indulgence in venery, inflammation of the bowels or kidneys, effusion in the spinal cord from a blow, a burn, or other injury; disease of the womb, or of the urethra, may also give rise to it. Palsy of either of the limbs may be caused by pressure, and general palsy by the action of lead or mercury upon the system; therefore those who work in these metals are peculiarly liable to be so affected, such as button gilders, glass silverers, plumbers, etc. The most dangerous form of this kind is when it affects the muscles of respiration, in which case it rapidly proves fatal.

Symptoms.—Among the premonitory symptoms of paralysis may be named headache, confusion of ideas, loss of memory, impaired vision, drowsiness, and partial stupor, with, frequently, numbness, and pricking or tingling sensation in the limb or part about to be attacked. With persons of a full habit, there will be heat and flushings in the face, and most of the signs of an approaching fit of apoplexy; then follow indistinct articulation, loss of power, and the other marked and unmistakable indications of an actual attack.

Treatment.—A proper treatment, in the case of a patient of a full habit, is strong purgatives—about five grains of calomel, followed by senna mixture, or croton oil pills, every four hours, until they operate freely. When there is faintness and confusion of intellect, give a teaspoonful of sal volatile in a glass of water, and repeat it in an hour, if required; no alcoholic stimulants should be administered; put the feet and legs in a hot mustard bath, and place the patient in a warm bed, with head and shoulders well raised. After they have once acted well, keep the bowels gently open with rhubarb or castor oil; let the diet be spare, and the quietude of the patient as perfect as possible. After the acute stage of the disease has passed, local stimulants should be used, and the affected parts well rubbed with the hand or a flesh brush. Electricity and galvanism may also be employed where there is no reason to suspect structural disorganization. In paraplegia it is often very difficult to get the bladder to act; and when it does, the urine flows from it involuntarily. Great attention should be paid to this, and stimulant diuretics given; the tincture of cantharides, in ten drop doses, is perhaps the best.

Sulphur baths and chalybeate waters often afford relief.

In palsy of the face, if it is caused by a blow or cold, hot fomentations and stimulating liniments should be applied; as also in palsy of the hands, fingers, or other extremities, with electro-magnetism, persevered in for a considerable time. In all cases of chronic paralysis, it should be borne in mind that the nervous system requires arousing and stimulating to a due performance of the functions necessary to life. In nearly all there is a sluggish action of the bowels, which are often obstinately constipated, and require the strongest purgatives to keep them at all open. It is sometimes better to employ enemas than continue giving drastic medicines. The paralytic patient frequently enjoys pretty good general health, and eats heartily; and this increases the above difficulty, especially if the patient is a heavy person, with little power of self-movement. When confined entirely to bed, sores and sloughing ulcers are not uncommon; an air or water bed greatly obviates the danger of them.

INFLAMMATION OF THE JOINTS OR ARTHRITIS.

Inflammation of the large joints of the body, chiefly the knee, elbow, hip, and sometimes the ankle. It is marked by the increase of liquid around the joint, attended by redness, swelling, and pain.

Causes.—There are a variety of forms due to rheumatism, gout, gonorrhœa, injuries, syphilis, and the tubercle bacillus of consumption.

Symptoms.—Marked redness; pain; swelling; fever in the joint; and indications of the flow of liquid into the part. The pains are indicative of the nature of the affliction, whether rheumatic, gouty, or tubercular. In tubercular inflammation, called white swelling, there is a gradual disintegration of the joint with a slow-forming, indolent, swelling caused by the *Bacillus tuberculosis*. There is suppuration, which affects the ends of the bones and the cartilages. These latter sometimes are completely destroyed by the inflammatory conditions so that the ends of the bones which form the joints are not separated but strike together causing intense pain.

Treatment.—There must be perfect rest to the joint and the patient must not bear the weight of the body upon it. All attempts to use the joint only irritate the already much-inflamed tissues and increase the pernicious condition. The internal treatment must be that suggested by the disease which causes the swelling.

Local applications include cold ice and compresses to reduce the inflammation; counter-irritants such as blisters, cautery, etc., to promote absorption of the fluid; extension apparatus, and immovable splints to keep the inflamed surfaces apart, and to prevent motion; and surgical operation in tuberculosis cases such as hip joint disease and similar affections. (For cold applications and counter-irritants, see page 256.) A local application for white swelling is:—

Powdered Gum Ammoniac,.....2 ounces.
Vinegar of Squill,.....Enough to form a paste.

Spread upon a piece of leather and apply daily to the joint.

Hip Joint Disease.—This generally occurs in children of a scrofulous habit. It prevails in cold, moist climates, and usually attacks children between the ages of seven and fourteen, though it is frequently met with before and after that time of life.

Symptoms.—The first symptom complained of is generally pain in the knee. Sooner or later the patient is observed to walk awkwardly and less vigorously than usual. Pain is felt in the hip joint itself, and, though aggravated by motion, often becomes more severe from time to time. Collections of matter make their appearance, most frequently in the outer wall of the hip, but occasionally in the groin and hip. The

patient, after a tedious illness, recovers with a stiff joint, and wasted or shortened limb.

Treatment.—As this disease is generally pretty far advanced before it is discovered, but little can be done for it in the way of domestic treatment. A surgeon should be consulted. As a general rule, counter extension may be used to advantage.

STIFFNESS OF JOINTS OR ANCHYLOSIS.

This may be caused by the introduction of the larva of an insect, or from a violent blow or fall, either of which will often bring on an inflammatory action, with an exudation and deposit of gritty matter, which settles between the bones forming the joints, and thus prevents their free movement.

Treatment.—Take a vessel sufficiently deep to admit of the immersion of the leg up to above the knee. Nearly fill it with water of the temperature of 98°, and pour in a strong decoction of elder flowers and tar. Take this bath night and morning; and apply to the affected part, three times a day, compresses saturated with the following lotion:—

Liquor of Ammonia,.....2½ ounces.
Camphorated Alcohol,.....3 drams.
Bay Salt,.....1¼ ounces.
Water, ...1 quart.

Mix. The compresses should remain on for ten minutes at a time. Afterwards apply a plaster made as follows:—

Lard, ...10 ounces.
Yellow Wax,.....3 ounces.

Mix these over the fire, with just sufficient hot water to form a mass; and add grated camphor, three ounces. Remove from the fire and let it cool. When sufficiently congealed, spread it with the blade of a knife or the handle of a spoon upon a piece of linen of the size required; and cover the whole with oilskin. Or, bathe the part night and morning with warm salt and water; rub well in, two or three times a day, almond oil; and, at the same time, endeavor by gentle movement to loosen the joint.

RHEUMATIC FEVER OR ACUTE ARTICULAR RHEUMATISM.

An infectious, but not contagious, disease which affects the large joints of the body, and is by some called acute inflammatory rheumatism.

Causes.—There is clear evidence that the disease is caused by an

infectious micro-organism. The predisposing causes are exposure to dampness and cold; wearing wet clothing; living in damp localities; sudden fall of temperature; enfeebling fevers and other diseases; male sex; and previous attacks. The disease is seldom seen in persons under ten or over fifty years of age. It is most common between the ages of twenty-five and thirty-five.

Symptoms.—The attack is usually sudden and comes on at night; there are chills; pain and stiffness in the joints; loss of appetite; usually moderate, but sometimes very high, fever; the perspiration is profuse and the sweat is of an acid reaction with a peculiar odor. There are thirst; scanty urine; constipation; and excess of urates in the urine. The pain and the perspiration prevent sleep; the patient is exhausted and the skin is covered with rash or prickly heat caused by excessive perspiration. The pain is intensified by efforts to move; the larger joints are affected; those of the fingers and toes usually escape; there are heat, redness, and swelling at the joints; and the inflammation skips about from one to another joint. But the joints are affected in regular order, that is, both knee joints, both elbow joints, at the same time. The duration of an attack is from thirteen to twenty-one days when not attended by complications. These may prolong the attacks for five or six weeks; and relapses are to be expected.

Prognosis.—Recovery is the rule in simple cases. Not more than three per cent of the cases terminate fatally; but in complicated cases the mortality is higher, depending upon the nature of the accompanying disease.

Treatment.—Absolute rest in a bed provided with blankets only. Sheets are not to be used. The clothing worn by the patient should also be of wool, and the bed-clothing must be arranged so as not to press upon the inflamed joint. The diet should be a milk diet, and at no time should food which is difficult of digestion be given. The patient should be encouraged to drink copiously of water for the purpose of flushing out the kidneys to carry off the poison of the disease.

There should be a dose of calomel followed by a saline purgative such as Hunyadi Janos water, Epsom or Glauber's salts. Salicylic acid or some of the salicylates are of great benefit:—

Salicylic Acid,.....½ ounce.
Solution of Acetate of Ammonia,.....4 ounces.
Sweet Spirits of Niter,.....1 ounce.
Simple Syrup,.....1 ounce.

Take a tablespoonful in a wineglassful of water every three hours.

Or:—

Salicylate of Soda,.....1 ounce.
Compound Tincture of Cinchona,.....3 ounces.
Peppermint Water,.....3 ounces.

Take a dessert-spoonful at first every three or four hours. On signs of relief from it, increase the intervals to every six hours.

Or:—

Acetate of Potassium,.....1 ounce.
Salicylic Acid,.....½ ounce.
Lemon Syrup,.....2 ounces.
Peppermint Water,.....8 ounces.

Take a tablespoonful in a wineglass of water every three hours. If, after five or six days of such treatment, there is no improvement, it is likely that salicylates are not the treatment required and that they will not cure. It is well then to give:—

Potassium Iodide,.....4 scruples.
Elixir of Cinchona,.....1½ ounces.
Infusion of Gentian,.....1½ ounces.
Water, ...1 ounce.

Take a dessert-spoonful in water every three or four hours.

Or:—

Wine of Colchicum Root,.....10 drops.
Iodide of Potassium,.....15 grains.

Take one such dose three or four times a day.

The joints may be well anointed with:—

Icthyol, ...1 ounce.
Lanolin, ...1 ounce.

and the joints may be wrapped in cotton batting.

Or:—

Bicarbonate of Soda,.....2 ounces.
Laudanum, ...½ ounce.
Boiling Water,.....2 pints.

Moisten flannel cloths with the above and wrap them around the joints. When the pain in the joints is great and they are inflamed, blisters of the size of a silver dollar are to be placed around the joint. If the pain persists:—

Mercurial Ointment,.....½ ounce.
Belladonna Ointment,.....½ ounce.

Apply locally to the joints.

There is very great danger of heart complications ensuing from an attack of rheumatic fever, and the danger exists for two or three weeks after apparent recovery. It is therefore absolutely necessary that the patient remain in bed for some days after he is apparently well. Going out under two weeks after he is able to sit up is running a great risk. The exertion of attention to business is too great a demand upon the weakened heart's action, and, even though immediate affections are not noted, there is danger of sowing the seeds of chronic heart disease for the future.

MUSCULAR RHEUMATISM.

An acute or chronic inflammatory affection of the muscles, marked by pain, stiffness, and tenderness of the muscles.

Causes.—It is nearly always caused by exposure to cold, damp, or direct drafts of cold air. A previous attack is a predisposing cause; and it affects adults only.

The varieties of muscular rheumatism are:—

Rheumatic Headache.—(See page 308.)

Wry Neck or Stiff Neck or Torticollis, which is rheumatism of the muscles of the neck. It generally affects only one side of the neck and back of the head. The head is twisted towards the affected side, and great pain attends any effort to turn it straight.

Rheumatism of the Thorax affects the muscles of chest and the intercostal (between the ribs) muscles. Deep breathing, coughing, and sneezing increase the pain.

Lumbago is rheumatism in the mass of muscles at the back. It is one of the most common forms, and usually involves both sides. All attempts to move greatly aggravate the pain. When it occurs in complication with sciatica the pain is intense.

Prognosis.—This is always favorable.

Treatment.—Rest is the first essential. Hot poultices composed of two-thirds pilocarpus leaves and one-third flaxseed meal are to be applied to the muscles affected. They are to be changed every two hours. For internal administration give:—

Antipyrine,.....10 grains.

One such dose every three hours.

Or:—

Salicylate of Strontium,.....10 to 15 grains.

One such dose three times a day.

If the rheumatism has been caused by cold, a very hot or turkish bath or a hot pack will remove the pain and stiffness, especially if the bath is followed by vigorous massage (pages 256 and 266).

Acupuncture is often of great relief in difficult cases.

Where there are great pain and loss of sleep give:—

Powdered Ipecac and Opium,.....10 grains.
Potassium Nitrate,.....5 to 10 grains.

Give one such dose in the form of a powder night and morning.

The following is a valuable liniment where only a small area is affected:—

Oil of Wintergreen,.....1½ drams.
Alcohol, ...2 ounces.

Rub thoroughly into the affected part.

In chronic cases and in lumbago, it is desirable to see that the bowels move regularly. Hunyadi Janos water, Epsom or Glauber's salts will be sufficient to secure this.

NEURALGIA.

A disease of the nervous system marked by sudden, darting, sharp pain which follows the course of the nerve.

Causes.—Neuralgia is usually a result of impoverished nerves, and requires the use of nerve tonics. It can frequently be traced to diseased growth of the bone about those parts through which the nerves pass; and, in some severe cases, it has been found to depend upon the irritation caused by foreign bodies acting upon those highly sensitive organs.

Among its exciting causes we may mention exposure to damp and cold, especially if combined with malaria; and to these influences a person with a debilitated constitution will be more subject than another. Anxiety of mind will sometimes bring it on, and so will a disordered state of the stomach; more particularly, a state in which there is too much acid. Tea, coffee, tobacco, and opium are prolific causes of neuralgia, as well as of other diseased conditions of the nerves. There are several forms of the disease, according to the part affected.

Neuralgia of the Head, Tic douloureux or Fothergill's disease, is treated on page 306.

Neuralgia of the Neck and Arm affects the arm, hand, shoulder, shoulder blade, breast, and neck.

Neuralgia of the Back and Side, or Intercostal Neuralgia, affects the parts mentioned.

Sciatica is neuralgia of the sciatic nerve which runs into the hip, inside of the thigh, calf of the leg, ankle, and heel.

Facial Neuralgia affects the nerves of the face.

Symptoms.—A violent, darting, and plunging pain, which comes on in paroxysms. Except in very severe and protracted cases, there is no outward redness nor swelling to mark the seat of the pain, neither is there usually constitutional derangement, other than that which may be caused by want of rest, and the extreme agony of the suffering while it lasts, which may be from one to two or three hours, or even more, but it is not commonly so long. Tenderness and swelling of the part sometimes occurs where there has been a frequent recurrence and long continuance of the pain, which leaves the patient, in most cases, as suddenly as it comes on. Its periodic returns and remissions, and the absence of inflammatory symptoms, are distinctive marks of the disease.

Treatment.—This must depend upon the cause. If it is a decayed tooth, which, by exposure of the nerve, sets up the pain, it should be at once removed, as there will be little peace for the patient until it is. If coexistent with neuralgia there is a disordered stomach, efforts should be made to correct the disorder. If the patient is living in a moist situation, he should at once remove to a higher level, and a dry, gravelly soil. Tonics, such as quinine and iron, should be given, and a tolerably generous diet, but without excess of any kind. In facial neuralgia, blisters behind the ears have been found serviceable; and, if the course of the nerve which appears to be the seat of the mischief can be traced, a belladonna plaster, or a piece of cotton soaked in laudanum and laid along it, will sometimes give relief; so will hot fomentations of poppies or bran poultices sprinkled with turpentine.

An application of chloroform on lint has sometimes proved very effectual in relieving severe neuralgic pains, and so has an ointment composed of lard and veratrum, in the proportion of six grains of veratrum to one of lard.

A mixture of chloroform and aconite has been recommended for facial neuralgia, the form of preparation being two parts of spirits of wine, or eau de cologne, one of chloroform, and one of tincture of aconite, to be applied to the gums of the side affected, by means of a finger covered with a piece of lint, or soft linen, and rubbed along them,—the danger of dropping any into the mouth being thus avoided. When the

pain is connected with some organic disease, as a decayed tooth, or chronic inflammation of the gums or of the sockets, or superficial necrosis of the bone, substitute tincture of iodine for the spirit in the above formula.

The shower bath, plenty of exercise in the open air, and attention to whatever will build up the general health must be carefully attended to.

Persons at all liable to this painful affection should be extremely careful not to expose themselves to wet or cold; above all, not to sit in draughts. A very slight cause will often bring it on, where there is the least tendency to it.

One severe and troublesome form of neuralgia is earache. It often occurs in children at the time of dentition. It may be distinguished from pain of an inflammatory character.

The following pill, known as Dr. Gross's pill, is of great value in all cases of neuralgia:—

Sulphate of Quinine,.....2 grains.
Sulphate of Morphia,.....1-20 grain.
Sulphate of Strychnia,.....1-30 grain.
Arsenious Acid,.....1-20 grain.
Extract of Aconite,.....½ grain.

Take one such pill every one, two, or three hours, according to the severity of the attack.

Or:—

Sulphate of Quinine.....2 grains.
Reduced Iron,.....1 grain.
Arsenious Acid.....1-20 grain.
Aconite, ...1-120 grain.

Take one such pill every four or five hours.

In intercostal neuralgia the following is of great benefit:—

Chloral, ...1 dram.
Powdered Camphor,.....1 dram.
Menthol, ...1 dram.

Rub together in a mortar, and paint over the affected part with a brush as needed.

In sciatica, 10-grain doses of antipyrine, or phenacetine, may be given twice a day. A flannel bandage should be applied to the whole length of the affected limb and changed daily. To prevent the pain caused by movement of the leg, Mitchell recommends the use of a splint reaching from the armpit down to the heel, strapped close to the body and limb.

Application of a blister to the part along the course of the nerve is also beneficial. In extreme pain, narcotic injections will be required.

ANAEMIA.

A disease of the blood in which there is a deficiency of red blood corpuscles and hemoglobin (the red coloring matter of blood).

Causes.—Deficient food; impure air; lack of sunshine; overwork; worry; prolonged nursing; cancer; Bright's disease; consumption; malaria; syphilis; etc.

Symptoms.—The skin, lips, tongue, gums, and ears are pale; loss of appetite; capricious appetite; irritable temper; depression of spirits; general weakness; occasional dizziness and fainting; palpitation of the heart and shortness of breath follow moderate exertion; excited heart action; hands, feet, and lower eyelids are puffy; face of a waxy appearance; menstruation is irregular, painful, or suppressed; dropsy of the ankles is present; and many complications may arise in long continued anæmia.

Prognosis.—Where the cause can be determined upon and promptly removed the outlook is favorable; but in direct or primary conditions the prospect is not so good.

Treatment.—Exercise; fresh air in abundance; sunshine; and a nutritious diet are first indicated. Tonics of iron, arsenic, strychnine, and quinine are very valuable. Carbonate of iron in from 2 to 5 grain doses, Basham's Mixture, or Blaud's pills may be used. In administering iron, great care must be taken not to bring about a constipated condition. Smith's "four chlorides" is an excellent tonic:—

Corrosive Chloride of Mercury,.....1 to 2 grains.
Solution of Chloride of Arsenic,.....1 dram.
Tincture of Chloride of Iron,.....4 drams.
Dilute Hydrochloric Acid,.....4 drams.
Simple Syrup.....4 drams.
Water enough to make.....6 ounces.

Take one dessert-spoonful in a wineglass of water after meals.

Chlorosis or Green Sickness is a form of anæmia, of unknown cause. The number of red blood corpuscles is normal, but the percentage of hemoglobin in each corpuscle is deficient. It is a disease to which boys and girls in their early teens are subject, but it is more common among girls than among boys. The skin has a more or less greenish, gray, or muddy tint. The patient is dull; there is a pain at the pit of the stomach;

and dark circles around the eyes. Menstruation is delayed, scanty, and irregular as well as painful. Constipation is common.

Treatment.—Practically the same as in anæmia.

CEREBRAL ANAEMIA.

A decrease of the supply of blood in the vessels of the brain. It is either general or partial.

Causes.—Partial anæmia of the brain usually results from the obstruction of one or more of the blood vessels in the brain, and may be caused by thrombosis or embolism (page 417). General anæmia is caused by hemorrhages; wasting diseases; sudden shock; weak heart action; heart disease; or is seen during recovery from severe attacks of fever.

Symptoms.—General anæmia of the brain is marked by great paleness; fainting; dizziness, which is increased by exercise; headache, less painful when lying down; frequent yawning; and occasionally by convulsions. Partial anæmia is indicated by a loss of power in some special muscles in the part of the body which is controlled by the area of the brain which is affected.

Prognosis.—Where the disease is caused by frequent and severe hemorrhages, the outlook is not favorable; if the cause is one which can be removed, the recovery is almost certain.

Treatment.—If general anæmia is the cause, the treatment must be along the lines of nourishing food, iron, arsenic, quinine, strychnia, as indicated on page 439. On the removal of the cause by such means the symptoms will disappear. It is not necessary that the patient pass all of the time in bed, but lying down for certain hours during the day will be of much relief. If fainting is frequent, follow the treatment as given on page 361. The treatment must be directed at the cause, and remedial measures advised for such conditions must be followed. For improvement of the blood these are valuable:—

Tincture of the Chloride of Iron,.....15 drops.
Dilute Phosphoric Acid,.....5 drops.
Solution of Chloride of Arsenic,.....3 drops.
Lemon Syrup,.....½ dram.
Syrup of Ginger to make.....2 drams.

Take one such dose every six hours in a wineglass of water.

Or:—

Sulphate of Strychnia,.....1 grain.
Sulphate of Quinine,.....48 grains.
Dilute Hydrochloric Acid,.....2 drams.
Compound Tincture of Gentian,.....3 ounces.
Water, to make.....6 ounces.

Take a teaspoonful in water after each meal.

CONGESTION OF THE BRAIN.

An undue fullness of the small blood vessels (capillaries) of the brain; often called "rush of blood to the head." It is called active fullness when the arteries are affected; passive when the veins are filled with blood.

Causes.—Active or arterial fullness is caused by full-bloodedness (plethora); enlargement of the left ventricle of the heart; excesses in eating and drinking; protracted mental labor; acute alcoholism; sunstroke; tying of a large artery in a surgical operation; and inhaling amyl nitrite. Passive fullness is caused by dilatation of the right side of the heart; pressure of accumulations of gas and liquids on veins in several parts of the body.

Symptoms.—These may be sudden or gradual; they are more marked while the patient is lying down. There are headache; neuralgic, darting pains; interference with hearing and sight; buzzing in the ears; flashes of light before the eyes; dizziness; contraction of the pupils; impaired mental powers; irritability of temper; red face; congested eyes; and beating of the large blood vessels in the neck (the carotids); disturbed sleep; and twitching of the limbs.

Prognosis.—Cases of moderate degree last for a few hours or days and pass off; but have a tendency to return. Severe cases are of the nature of apoplexy but usually are forerunners of a hemorrhage of the brain.

Treatment.—Elevate the head; apply ice bag or cold cloths to the head (page 256) and warm applications to the feet. Leeches may be applied to the large process behind the ear (the mastoid); dry cups may be used on the neck (page 238). In severe cases of an apoplectic nature, bloodletting will be beneficial. Good results follow the energetic use of purgatives such as:—

Croton Oil,.....3 drops.
Glycerine, ...15 drops.

Give one such dose placed well back on the tongue.

Or the following enema:—

Epsom Salts,.....2 ounces.
Glycerine,.....1 ounce.
Boiling Water,.....4 ounces.

Administer as an enema gently (page 234).

A mustard application to the back of the neck is often useful in mild cases.

DIZZINESS OR VERTIGO.

A condition in which either the person affected or the objects around him seem to be in a state of rapid, circular, rotatory, or backward and forward motion.

Causes.—It may be caused by paralysis of the muscles of the eye, by eye-strain or astigmatism; in which cases it is called ocular vertigo or dizziness. **Meniere's Disease** is the name given to the sudden severe dizziness resulting from an affection of the semicircular canals (the cochlea) or the labyrinth in the inner ear. It is the result of a hemorrhage or of the escape of pus or other discharges in that disease. **Gastric Vertigo** is the commonest form and is caused by indigestion in the stomach or in the intestines, liver trouble or constipation. **Nervous Vertigo** is the result of excesses, the excessive use of tea, coffee, tobacco or alcohol, as well as of organic brain diseases. **Senile Vertigo,** or the vertigo of old age, is caused chiefly by anæmia of the brain, as well as by changes in the eye in old age (presbyopia).

Symptoms.—The symptoms common to all forms of vertigo or of vertigo from whatever cause are a sensation of objects revolving around the sufferer or of the objects remaining stationary and the patient seeming to move around them; the attack is sudden; sight is indistinct; mind is confused; the patient is liable to fall, and grasps at a support; sometimes vomiting and nausea are present; but there is no loss of consciousness, though the patient may fear it. Other symptoms are peculiar to the several forms.

In **Ocular Vertigo,** which usually follows too close an application to reading, sewing, fine work, there are headache; pain in the eyeballs: and floating specks before the eyes.

In Meniére's disease of the ear there are noises in the ear; objects move with a variety of motions; there is often a rising and sinking

motion as though the patient were borne on a wave; the sufferer often falls by reason of the suddenness of the attack; moroseness; irritability of temper, and suspicion; and the attack is usually of long duration.

In gastric vertigo there are usually the symptoms of indigestion, such as flatulency; heart-burn; nausea; pain after eating; constipation or diarrhœa; and often great pain in the back of the neck.

In nervous vertigo there is irritability of temper; sleeplessness; headache; nausea; vomiting; and sometimes symptoms of epilepsy and softening of the brain.

In senile vertigo, dizziness of old age, the attack usually follows exertion, or even that of sitting erect or standing; the head swims; chilliness and weakness, with temporary blindness or darkness, are felt.

Prognosis.—This is favorable in ocular and gastric vertigo; good in nervous vertigo, unless it is organic in its nature; bad in true Meniére's disease and in senile vertigo.

Treatment.—In ocular vertigo, the proper treatment is that given by a good oculist, and consists in the application of good fitting lenses for the correction of eye trouble of even slight degree. In Meniére's disease, the patient must lie down, not necessarily in bed. A 2-grain dose of sulphate of quinine every four hours for an extended period is advisable.

In gastric vertigo, attention must be paid to the regulation of the diet. See diet for dyspepsia (page 281.) It may be well to start with a milk diet exclusively and gradually extend it as improvement takes place. It is well in such cases to take:—

Fowler's Solution of Arsenic,.....2 to 3 drops.

Take in water after each meal.

When the digestion is slow, 6 to 8 drop doses of nux vomica may be taken in water after each meal.

In cases of constipation:—

Fluid Extract of Cascara Sagrada,.....1 ounce.
Glycerine,.....1 ounce.
Compound Tincture of Cardamom,.....½ ounce.
Peppermint Water,.....½ ounce.

Take a teaspoonful in a wineglassful of water three times a day.

For nervous vertigo, the cause must be treated. Where it is caused by excesses or abuse of narcotics these are easily regulated. For senile vertigo the diet must be highly nutritious, and a moderate use of whisky may be permitted.

In all forms of vertigo the patient should not use tea, coffee, tobacco, malt or alcoholic liquors, except as above stated, or highly seasoned foods.

ABSCESS.

A collection of pus or matter which forms a cavity in and among tissues and parts which before the attack were entirely closed. It therefore has no communication with the outside until such times as it ripens and bursts. In this respect it differs from an ulcer, which is on a free surface, and is open from the beginning. It differs from a collection of pus or matter in a natural cavity of the body, because that accumulates in a cavity which previously existed, and was not made by the breaking down of tissues.

Cause.—The cause of an abscess is inflammation. That state may be constitutional and produced by such diseases as consumption, scrofula, pyæmia, or other diseases caused by the invasion of contagious microbes; or it may be the result of local causes, such as injury or the presence of a foreign body. Sometimes an abscess breaks or points at or very near the site of the cause. In other cases it may be far away from it; as in the case of Psoas abscess, which appears in the groin, although the exciting cause is in the spine. The pus formed in this case burrows among the tissues of the muscles and forms an abscess at a considerable distance from the starting point.

Symptoms.—Acute abscesses are attended by inflammaton, redness, pain, caused by the pressure upon the nerves; heat, and sometimes by hemorrhage when blood vessels have been involved and broken down by the progress of the abscess. Chronic abscesses are slow in development and are not attended by heat or pain.

Treatment.—Take a slightly cooling and gentle aperient such as Hunyadi Janos water, Epsom or Glauber's salts, or a Seidlitz powder.

Foment the part with hot flannel, and apply a poultice of linseed meal. In parts where the poultice is difficult to retain, it must be put in a bag made of muslin with a tape attached to each corner of the bag to fasten it on and retain it in its place. The poultice should be renewed every six or eight hours. When the abscess looks white in the center, it is ripe and should be opened. After discharging pretty freely, a slip of lint should be inserted by a probe, and renewed once or twice a day, according to the nature of the discharge. After this the part should be supported by a bandage, or slips of adhesive soap or plaster, to facili-

tate contraction; and the aperture should be left open to facilitate the discharge. When healed, tonic medicine and change of air should be resorted to. During the continuance of the abscess, the patient should live on food which is plain and nutritious, without being stimulating, avoiding at the same time, except under extraordinary circumstances, wine, spirits, and beer.

ABSCESS IN THE EAR.

Apply warm fomentations; syringe the ear with warm water. When the abscess has broken and discharged freely, the ear must be kept clean, and a syringeful of slightly astringent lotion, such as ten grains of sulphate of zinc to a quarter of a pint of rose water, should be injected lukewarm twice a day. Or this will be found beneficial: When there is much discharge, injections of warm soap and water should be used to cleanse the ear, and a little fine boric acid blown into it with a quill or powder blower. This treatment should be followed twice a day until the discharge ceases.

ULCERS.

A loss or destruction of the parts on a free surface caused by the death of the tissues.

Cause.—An ulcer may be the result of a wound or bruise, not usually a recent one; it may be tuberculosis (or scrofulous), caused by the tubercle bacillus; varicose, caused by varicose veins; syphilitic; or the result of irritation.

Symptoms.—They appear on the mucous membranes, such as the mouth, tongue, throat, stomach, bowels, etc.; and on the outer surfaces of the body. They present a variety of appearances and are classified according to their condition. A healthy ulcer is one which is proceeding satisfactorily to a cure, or is healing. It has smooth, unhardened edges, a flow of colorless or yellowish thin fluid; red surface; covered with painless little growths like grains; and by a formation of skin growing over the surface or coming out from the edges. An inflamed ulcer is swollen, painful, with puffy edges, painful little grains on the surface, and more or less covered with pus or a thick yellow secretion. A sloughing ulcer is inflamed, with rough overhanging edges, and a sloughing or eating away of the tissues. A fungous or weak ulcer has pale, flabby grains abundantly covering the surface and projecting above it. A

callous or hard ulcer or indolent ulcer has hard, discolored edges, pale, and very few grains, and a bad smelling discharge of pus. A cold ulcer occurs at the extremities, especially the feet, and is the result of bad circulation and nutrition of the parts. A perforating ulcer occurs in locomotor ataxia, and is the result of loss of nerve supply.

Treatment.—In tuberculous and syphilitic ulcers, the treatment is constitutional and directed to the cure of the diseases. Others receive protective and antiseptic dressings. A good dressing is:—

Iodoform, ... 1 dram.
Vaseline, ... 1 ounce.

Apply locally.

Oxide of zinc ointment and aristol are also effective in the dressing of ordinary ulcers. Weak and fungous ulcers require stimulation by touching the ulcer with nitrate of silver (lunar caustic) in stick form or in solution as follows:—

Nitrate of Silver, ... 30 grains.
Water, ... ½ ounce.

This is to be applied to the surface of the ulcer once daily. This is effective in ulcers in the mouth and throat, as in putrid sore throat, and sore mouth. Another beneficial local application is Black Wash, made as follows:—

Calomel, ... 1 dram.
Limewater, ... 1 pint.

Apply locally once daily.

Proud Flesh.—This is a name applied to the red granulations which often appear on the surface of wounds and ulcers. If they rise above the level of the skin they may be destroyed by a caustic application, such as the nitrate of silver or sulphate of copper (blue stone); a few grains of red precipitate, or a little powdered lump sugar. The first-named of the above is the most effectual, but care should be taken in applying it only to touch the spots themselves.

CORNS.

In the treatment of corns, the first object should be to remove the exciting cause; comfortable, well-fitting boots or shoes should be substituted for those of an opposite character, and the corn, after the foot has been soaked in warm water to soften it, should be pared carefully

away, particular care being taken not to wound the more sensitive part. When the outer surface is removed, there will be perceived in the center a small white spot, which should be carefully dug out with a pointed knife or other sharp instrument. When this, too, is removed, cover the seat of the corn with a small circular piece of thick, soft leather spread with soap or diachylon plaster, and leaving a small hole in the center, corresponding with that from whence the root of the corn has been taken. Should any of this latter remain, so as to cause irritation, apply to it, every second or third day, a piece of lunar caustic, scraped to a point and slightly moistened. Some persons apply strong acetic or other acid; but this is not so effectual, and more likely to cause inflammation, which will be best allayed by a warm poultice of bread crumbs, moistened with Goulard's extract, the foot being held up as much as possible, and the system kept in a cool state with saline aperients, etc.

Soft corns, which form chiefly between the toes, are often very painful and troublesome; let them be cut away as close as possible with a pair of scissors, and then dressed with rags wet with Goulard's extract, or a solution of sugar of lead; ivy leaves form, for such, a cool, pleasant protection from friction; they should be put on fresh every day.

Beneath the corner of the nail of the great toe a peculiar kind of corn sometimes occurs; it should be cut or scraped out with the finger nail, and caustic applied as above directed. Mere callosities of the skin on the hands and fingers are not corns, although often called so; they have no roots and are not painful, therefore it is best not to interfere with them; for, if removed, others would come in their places, while the friction in which they originate is kept up.

INGROWING NAILS.

It often happens that a tight or ill-made shoe, by continual pressure on one part of the nail, forces it into the flesh, and thus causes great pain and inconvenience.

Treatment for the Toe.—First procure an easier shoe, which will allow the nail to take its natural course; then take a piece of glass, and with it scrape the whole length of the middle of the nail persistently and yet with a delicate hand. By this means the center of the nail will eventually be rendered so thin that it may be readily bent, and in this flexible condition it gives way to the upward pressure of the skin on its outward edges, readily bends, and offers no further resistance. The

cause of irritation being withdrawn, the tenderness soon heals, and the proud flesh drops down.

An ingrowing nail may be caused by an improper mode of cutting it. Nails should never be clipped at the corners, but cut straight across the top, if anything, slightly notched in the middle. This leaves a sufficient amount of resistance at the corners; for, wear what shoes we may, there must always be a certain degree of pressure on the nail, which should be provided for.

Treatment for the Finger.—Wrap the affected finger in a compress moistened with a lotion made as follows:—

Liquor of Ammonia,.....1 ounce.
Camphorated Alcohol,.....1 dram.
Bay Salt,.....¼ ounce.
Water, ...¾ pint.

Mix, and shake well together. After ten minutes, remove this and replace it by a compress anointed with camphor pomatum, and kept in place till next dressing by a rubber finger-stall drawn over it. Then dissolve one and a quarter ounces of camphor in a gill of brandy, wet a narrow band with this solution, place it round the root of the nail, and let it remain there until the next dressing.

The finger nails should be cut of an oval shape, corresponding with the form of the finger; they should not be allowed to grow too long, as they thereby are rendered more liable to accident; neither should they be too short, as they thus deprive the ends of the fingers of their protection and support. When the nails are naturally ragged or ill-formed, they should be gently scraped, afterwards rubbed with lemon, then rinsed with water, and well dried with a towel. If the nails grow more to one side than the other, they should be cut in such a manner as to make the points come as near as possible to the center of the end of the finger.

CHILBLAINS.

Chilblains are an inflammatory affection of the skin, generally confined to the extremities, and especially to the fingers and toes. Exposure to sudden alternations of heat and cold usually gives rise to these troublesome visitations, which are rather characterized by itching and irritation than pain. Persons of scrofulous habit and languid circulation are most subject to them, as children and aged persons. It is a popular fallacy that to keep the surface of the skin in a state of unnatural warmth, by

hot bottles and woolen socks by night, and fur linings and feet-warmers by day, is the best way to prevent chilblains; but this only serves to keep up a constant perspiration, and so weakens the tone of the system and increases the liability to them. A nightly footbath of cold or—for aged persons—of tepid salt and water, with plenty of friction with a rough towel, and exercise during the day, will be most likely to keep chilblains from the feet; and for the hands, a careful rubbing so as to get them carefully dry after every washing or dipping in water, and an avoidance of all unnecessary exposure to severe cold, are the best preventive measures. It is a good plan to have a pan of oatmeal always at hand, and to rub them well over with that after they have been wetted, and wiped as dry as possible. This will absorb any moisture left by the towel, and have a softening and cooling effect. Bathing the feet and hands every night in warm water in which a small quantity of salt is dissolved is one of the best preventives against chilblains.

Treatment.—Should chilblains come, as sometimes they will in spite of all precautions, let them be gently rubbed every night and morning with some stimulating application; alcohol, spirits of turpentine, or camphorated spirits of wine are all good for this purpose; but the application which we have found most efficacious is a lotion made of alum and sulphate of zinc—two drams of each to half a pint of water, rubbed in warm; it may be made more stimulating by the addition of one ounce of camphorated spirits. When the chilblains are broken there must be a different course of treatment; the ulcers formed are often difficult to heal, especially in weakly and ill-conditioned persons; there is generally a great deal of inflammation, which must be subdued by means of bread and water poultices applied cold, and afterwards by cooling ointments, such as the cerate of acetate of lead, or spermaceti ointment, with forty drops of Goulard's extract added to the ounce; should there be a disposition to form proud flesh, the ointment of red precipitate should be used.

On the first symptoms of the appearance or the return of the redness or itching, wash the parts with a little warm spirits of rosemary to which a few drops of turpentine have been added. If the itching persists it can be relieved by a bath of:—

Alum, ...1 ounce.
Rock Salt, ...2 ounces.
Borax, ...2 ounces.

Powder and mix. Add two teaspoonfuls to a footbath of tepid water and soak the feet for fifteen minutes.

The application of camphor has a most soothing effect. Another good lotion is:—

Glycerine, ... ½ ounce.
Tincture of Iodine, ... 10 grains.
Laudanum, ... 10 grains.

Mix and shake until thoroughly dissolved. Apply with a camel's-hair brush to chilblains that have broken as well as to those which have not.

RASHES.

Patches of superficial redness of the skin; they may occur on any part of the body, and are generally accompanied by increased heat and irritation—sometimes by swelling, inflammation, and considerable pain; they are not contagious.

When red blotches occur in the face they are generally connected with some constitutional derangement—often with dyspepsia—to the cure of which the general treatment must be directed; the face should be washed in warm water, and the blotches dabbed with camphorated spirits.

ROSE RASH.

Rose rash is common with children during dentition, and is therefore called tooth rash. It arises from intestinal irritation, and most usually shows itself about the face, although it may appear on any part of the body. With adults it usually occurs in hot weather; fatigue, drinking largely of cold water, or eating indigestible food, will bring it forth. It sometimes occurs during the eruptive form of smallpox, and sometimes after vaccination. Mild aperients, such as rhubarb and magnesia, cooling drinks, tepid baths, with frugal diet and rest, are the best remedies. There is usually considerable itching with these rashes, which may be allayed by the application of Goulard's extract or some other cooling lotion.

HIVES OR NETTLE RASH.

This is an eruption of the skin similar to that produced by the sting of nettles. It is not dangerous nor contagious.

Causes.—It is generally thrown out by some particular kind of food which disagrees with the system, such as crabs or other shellfish, or mackerel; certain vegetables are likely to produce it, such as mushrooms,

cucumbers, bitter almonds, or strawberries. Copaiba, cubebs, valerian, or the fumes of turpentine inhaled during house painting are also likely to occasion nettle rash.

Symptoms.—The eruption consists of little, solid eminences of irregular outline, but generally roundish or oblong, and either white or red, or both white and red. It is accompanied with intense heat, and a burning or tingling in the affected spots. No part of the body is exempt from nettle rash. There are two varieties of this disorder, one of which is regarded as acute, the other as chronic, and either persistent or intermittent. The acute form is usually preceded or attended with feverishness, and a feeling of general uneasiness, headache, nausea, and vomiting. In general it appears in the morning, vanishes in the course of a few hours, and perhaps reappears again twice or thrice during the day. It usually disappears entirely in six or eight days. The chronic form of this complaint is intractable and difficult to remove, coming and going for a lengthened period, but with little or no feverishness.

Treatment.—An emetic should be first administered, if the eruption is caused by anything recently taken into the stomach; it should be followed by a saline aperient—senna mixture, with salts, is perhaps best, and this repeated until the bowels are freely moved; if the febrile symptoms do not subside, a mixture composed of sweet spirits of niter, two drams; liquor of acetate of ammonia, one ounce; and camphor mixture, five ounces, should be given, two tablespoonfuls every four hours. In the chronic form, a simple diet, active exercise, an avoidance of any articles of diet likely to excite the eruption; keeping the bowels regular by gentle aperients combined with antacids; a five-grain rhubarb pill an hour before dinner, or a small piece of the root chewed, are good remedial means; the tepid bath should be occasionally used, or sponging, to keep the skin in a healthy state; to allay the irritation, dust starch powder over the eruptions, or use a lotion made of rose or elder flower water in half a pint of which has been dissolved one dram of carbonate of ammonia and one-half dram of sugar of lead.

DISCOLORED SKIN.

Moles, freckles, and sunburn are some of these affections.

Freckles are brown spots on the face and hands caused by exposure to the sun. Persons affected with these unsightly discolorations may remove them, without using cosmetics, by merely stimulating the absorb-

ent vessels of the skin to take them up and carry them away. Any smart stimulant will act in this way; but it has been found that the safest are taken from the vegetable kingdom. One of the best and easiest is Withering's cosmetic lotion, which is made of a teacupful of soured milk, and a small quantity of scraped horse-radish; let this stand from six to twelve hours, then use it to wash the parts affected twice or thrice a day.

Moles in the skin, or, as they are commonly called, mother-marks, are beyond the reach of medical treatment; if they are ever removed, it is at the risk of causing a greater disfigurement; therefore they had better be left alone, the more especially as they not infrequently answer a useful end—that of positive identification. Large moles which tend to enlarge should be removed by the surgeon, as they sometimes develop into cancerous growths.

DISORDERS OF THE SWEAT GLANDS.

The proper action of the skin is of the greatest importance to the health. Too much or too little perspiration may produce serious consequences; but can generally be corrected by cold or warm baths, tonics, friction, and proper clothing.

DISORDERS OF THE OIL GLANDS.

When the skin is not well taken care of, or when a person has very sedentary habits, the action of the oil glands becomes sluggish; the matter in the tubes becomes hard and dry and distends them, sometimes raising them above the surface, and the ends become black. Again, the oily matter is poured out too profusely, so that the skin shines with it; or, at times, there may be so little that the skin is harsh and dry.

Treatment.—For roughness and hardness of the skin, wash with soap and water every night, and rub well into the skin an ointment made of olive oil, four ounces; carbolic acid, one dram. Take a dose of sulphur and cream tartar twice a week.

Where the oil tubes have hardened, and formed a horny growth, the body should be washed with a quart of water, in which a teaspoonful of saleratus is dissolved; and twice a day use the following ointment:—

Elder Flower Ointment,.....1 ounce.
Blue Vitriol,.....1 scruple.

For blackheads in the skin, wash in strong soapsuds twice a day, and rub briskly with a coarse towel, and use the following lotion:—

Corrosive Sublimate,.....5 grains.
Cologne, ...2 ounces.
Soft Water,.....6 ounces.

Mix and apply each night and morning. A spare diet will do much in some cases toward improving the skin.

PRICKLY HEAT OR LICHEN.

This is a disease caused by intense and long-continued heat; but it may be excited by the same causes which produce the nettle rash, when the system is prepared for it. It is one of the most annoying plagues of a tropical climate.

Symptoms.—The general character of the disease is that of a diffuse eruption, with red pimples, and a troublesome sense of tingling or prickling. There is more or less general irritation, and sometimes a little fever at the commencement.

Treatment.—For the relief of the itching and burning sensation attendant on prickly heat, which in tropical countries are often absolutely unbearable, the best remedy is cold water—using caution when the patient is perspiring. Live sparingly, and take a few doses of a mild purgative, as the following:—

Powdered Aloes,.....2 drams.
Powdered Rhubarb,.....1 dram.
Powdered Jalap,.....2 drams.
Powdered Cream of Tartar,.....4 drams.
Magnesia, ...1 dram.
Best Honey,.....1 ounce.

Mix well, and divide into one hundred and twenty pills; take two, three, or four on going to bed.

IRRITATION, ITCHING OR PRURIGO.

A papulous affection of the skin, accompanied by troublesome itching. Sometimes it is attended with a sensation as of ants or other insects creeping over and stinging the skin, or of hot needles piercing it. This disease, although not dangerous, is a cause of great discomfort, and sometimes even misery; it attacks persons of all ages, and is not easily got rid of, sometimes lasting for months, and even years.

Treatment.—Wash well, every evening before going to bed, with

castile soap, and allow it to dry in. Brandy or alcohol may be used in the same manner. An ounce of lemon juice in a pint of water, or vinegar used in the same proportion, will be found useful; also, water and spirits of camphor. The diet should be carefully regulated, and all stimulants avoided.

ITCH OR SCABIES.

An animal parasitic disease of the skin, highly contagious and liable to affect persons of all ages and stations of life.

Cause.—It is caused by the itch parasite, *acarus* or *sarcoptes scabiei.* It is contracted by contact; bedding, clothing; etc.

Symptoms.—The itch mite at once begins burrowing in the skin, causing an intolerable itching. In the efforts of the patient to obtain relief by scratching, the skin is often broken. The eggs of the insect are deposited under the skin in burrows, which are increased in number to accommodate the brood as hatched. The itching is worse at night, and crusts are likely to form as a result of the severe scratching. Favorite sites are the hands, between the fingers, wrists, breasts, and the inside of the thighs. The surest identification of the disease is by detection of the insect with a magnifying glass.

Prognosis.—The disease is not self-limited, that is, it will not cure itself without treatment. It is not a difficult disease to get rid of by proper measures.

Treatment.—The bedding and clothing of those affected must be thoroughly disinfected or sterilized (page 163). The insect is to be first killed, then the inflammation excited by its presence is to be allayed. Sulphur is the specific in this case:—

Precipitated Sulphur,.....1 dram.
Vaseline, ...1 ounce.

Apply locally at night. The face and head are not to be treated, but the rest of the body is to be covered with this ointment for four successive nights. Proper care must be taken to avoid soiling the bedding. The patient may wear old underclothing, socks, and a flannel gown to afford this protection. On the fifth day a hot bath is to be taken, the clothing changed, and the treatment repeated, if necessary. If the disease has not disappeared, a third application is necessary. It may be that after the third application only a few isolated sections are left. These are to be treated with:—

Carbolic Acid,.....5 to 10 grains.
Vaseline, ...1 ounce.

ECZEMA, HERPES OR TETTER.

After a slight feverish attack, lasting two or three days, clusters of small, transparent pimples, filled sometimes with a colorless, sometimes with a brownish lymph, appear on the cheeks or forehead, or on the extremities, and at times on the body.

The pimples are about the size of a pea, and break after a few days, when a brown or yellow crust is formed over them, which falls off about the tenth day, leaving the skin red and irritable. The eruption is attended with heat, itching, tingling, fever, and restlessness, especially at night. Ringworm is a curious form of tetter, in which the inflamed patches assume the form of a ring.

Treatment.—The treatment should consist of light diet and gentle laxatives. If the patient be advanced in life, and feeble, a tonic will be desirable. For a wash use:—

White Vitriol,.....1 dram.
Rose Water,.....3 ounces.

Mix; or an ointment made of:—

Elder Flower Ointment,.....1 ounce.
Oxide of Zinc,.....1 dram.

MOIST ECZEMA.

This is an eruption of minute, round pimples, about the size of a pin's head, filled with colorless fluid, and terminating in scurf. It is preceded by languor, faintness, perspiration, and a prickling of the skin. Another species of this disease is called sun-heat, which is an eruption of a white or brownish color, which generally terminates in yellow scabs. It occurs only in summer, and affects those parts which are uncovered.

In still another species, the eruption is attended with pain, heat, itching, intense smarting, and a swelling of the affected part. When the blisters break, the water runs out, irritates and inflames the skin.

Treatment.—Spare diet, cooling drinks, gentle purgatives, and warm baths. In old, chronic cases, apply externally either limewater or corrosive sublimate in a wash proportioned of five grains to one pint of soft water. In the last two forms of the affection, apply nitrate of silver in solution to the parts.

MILK CRUST ECZEMA.

This eruption consists at first of slightly elevated pustules or pimples, closely congregated, with an inflamed border. These break, and the surface becomes red, excoriated, shining, and full of pores, through which a thin, unhealthy fluid is poured out, which gradually hardens into dark, yellowish-green scabs. When this tetter invades the head or scalp, it causes the hair to fall off and is termed a *scall.*

Treatment.—Vapor bath and water dressing. The crusts should be removed by a weak lye, made from hard wood ashes or potash; then an ointment should be applied, made of:—

Mild Nitrate of Mercury Ointment,.....3 drams.
Sugar of Lead,.....16 grains.
Rose Water Ointment,.....1 ounce.

RINGWORM.

Ringworm is an eruptive disease of the skin—more particularly of the head—and of which there are several kinds.

Causes.—Ringworm has its seat in the roots of the hair, and is believed to be attended by the growth of parasitic fungi; its predisposing causes are any derangement of the general health from ill or under feeding, breathing impure air, drinking bad water, uncleanly habits, scrofula. Its immediate or exciting cause is generally contact with those affected with it, or using combs or hair brushes which they have used.

Wilson remarks that improper food is a frequent predisposing cause, and that he has observed it in children fed too exclusively on vegetable diet. It is said to occur spontaneously in children ill-fed and uncleanly, and it is readily propagated by contagion. It has recently been discovered that this disease is owing to the presence of a cryptogamic parasite, called the *trichophyton.*

Symptoms.—The most common kind commences with clusters of small, light-yellow pustules, which soon break and form into thin scabs, which, if neglected, become thick and hard by accumulation. When removed, they appear again in a few days; and by these repetitions the incrustations become thicker, and the area of the patches extends, so as, if unchecked, to affect the whole head, and extend also to the forehead and neck. The patches are of an irregular, circular form. This disease occurs generally in children of three or four years and upward.

Treatment.—The treatment consists in applying to the parts some

preparation which will destroy the fungus. The first thing to be done is to remove the hair. Afterward the parts should be washed with a solution of bichloride of mercury (one part to 250 parts of water), or with a solution of sulphurous acid, one part to eight of water. The general health should be at the same time attended to, and nutritious diet, tonics, cod-liver oil, and regular exercise used when necessary.

The vesicular form of ringworm is the simplest and most amenable to treatment; sometimes it disappears after careful washing and poulticing, with, perhaps, a few applications of any astringent lotion; but the pustular form is far more troublesome and intractable, spreading often very rapidly, and running into ulcerous sores, and sometimes reappearing when it is thought that a cure has been effected. Nothing but the greatest care and attention will then eradicate it. Any child afflicted with this disease should be separated from other children, on account of its contagious nature; wearing each other's caps and bonnets will be likely to spread it through a whole school.

The following will speedily cure this affection:—

Naphthol, ... 1 dram.
Citrine Ointment, ... 1 dram.
Thymol, ... 5 drops.
Vaseline, ... 1 ounce.

Mix and make into an ointment and apply twice a day.

CARBUNCLE OR ANTHRAX BENIGNA.

A painful, deep-seated, dark red inflammation of the skin, ending in the death of the tissues affected.

Causes.—The primary cause is a micro-organism; predisposing causes are bad health, diabetes, and injury to the part.

Symptoms.—The first appearance is in the form of an inflamed area on the back of the neck, on the shoulder, or between the shoulder blades. It is rounded in shape; and the area soon becomes hard, circular, and flat. It varies in size from that of a hazelnut to an orange. The color is purplish or violet. After a week or ten days the skin breaks and sloughs off, leaving passages for the outlet of pus. Finally the entire area assumes the appearance of a large purulent ulcer, with firm edges, and the granulations of an ordinary healthy ulcer appear, and the part heals, leaving a scar. The growth of the carbuncle throughout these stages is attended by heat, pain, and throbbing.

Prognosis.—The outlook is always serious, as blood poisoning is more than a possibility at almost any stage.

Treatment.—The general health must receive attention from the beginning of the attack. To this end the diet must be nourishing; stimulants are required. A valuable tonic for this condition is:—

Tincture of the Chloride of Iron,.....15 drops.
Solution of the Chloride of Arsenic,.....3 drops.
Lemon Syrup,.....½ dram.
Syrup of Ginger, to make.....2 drams.

Take one such dose every six hours.

Or:—

Sulphate of Strychnia,.....1 grain.
Sulphate of Quinine,.....48 grains.
Dilute Hydrochloric Acid,.....2 drams.
Compound Tincture of Gentian,.....3 ounces.
Compound Tincture of Cardamom, to make 6 ounces.

Take a teaspoonful in water after each meal.

The local treatment consists of the injection of a saturated solution of crystals of carbolic acid in every direction throughout the tissue. It is very painful for a time, but is very beneficial. Stick caustic potash may be used to cauterize the sloughing tissues. When incision is necessary, the cuts are made in the form of a cross (crucial incision). When gangrene threatens, the parts must be well treated with antiseptic solutions. If septicæmia (blood poisoning) threatens, it is necessary to cut the parts out.

BOIL OR FURUNCULUS.

An acute affection of the skin marked by the presence of one or more superficial abscesses or boils.

Causes.—The follicles of the hair become impregnated with micro-organisms which produce pus. Predisposing causes are poor health; anæmia; diabetes; uræmia; friction or injury to the skin; uncleanliness; and contact with certain substances such as tar and petroleum, which act as irritants.

Symptoms.—The boil begins in the sebaceous gland (a sweat gland) and never in the tissues. As soon as it has attained a certain size the parts affected form a core of dead tissue, and when the boil is mature the core comes away with the pus. Although boils occur in numbers and in crops as well as singly, they show no tendency to spread. The

abscess begins as a small, round spot, highly inflamed, and of a reddish color. It runs its course in about a week, at the end of which time it is raised, rounded, pointed, with a yellowish point in the center. This yellowish center is called the core; when no core is formed the boil is spoken of as "blind." The pain is dull and throbbing; increased on pressure, and usually worse at night. Boils in the armpit, and parts other than the neck and face, are deeper seated and more painful than others.

Treatment.—Warm applications are required to hasten the formation of pus. It is necessary to protect the parts from pressure and friction by means of soap plaster and adhesive plaster.

EXCESSIVE PERSPIRATION OR HYPERIDROSIS.

A disturbed condition of the sweat glands, marked by an excessive secretion of sweat.

Causes.—The condition has never been satisfactorily explained. Disturbance of the sympathetic nervous system often has some connection with the affection.

There are many variations, both in character and degree, of the disease. It may be acute or chronic; general or partial; constant or intermittent. Local manifestations of it are usually confined to the hands, feet, armpits, and genitals. Excessive perspiration of the hands is annoying on account of its profuseness; as often as it is dried, there is an immediate flow which interferes with the use of the hands in certain occupations, and renders the wearing of gloves impossible. Excessive perspiration of the feet is still more annoying and often offensive. The socks and shoes become bathed with the perspiration which, being retained, gives rise to an offensive odor. The feet are rendered tender by its presence and the patient becomes foot-sore. When the disease affects the armpits and the genitalia, the odor is also often very offensive, much more so in males than in females.

Prognosis.—Cases are often hard to manage, as the conditions persist in spite of care and attention. When the affection is local, especially in the feet, the prognosis is favorable.

Treatment.—Local treatment is by far the most effectual. Bathe, cleanse, and immediately dry the part. One of the best local applications is tincture of belladonna applied either diluted or full strength. Astringent lotions, such as alum, or tannic acid, made in the proportion of from

1 to 8 drams to a pint of water, are also effective. In such cases the astringent closes the pores of the skin in the part and cuts off the secretion. Dusting powders are also beneficial. Among the best of these are:—

Salicylic Acid,.....20 grains.
Oleate of Zinc,.....1 ounce.

To be applied locally.

Or, after the parts have been washed in a weak solution of carbolic acid:—

Salicylic Acid,.....½ dram.
Prepared Chalk,.....1 ounce.
Dried Alum,.....1 ounce.

When powdered finely apply with a powder puff.

Or:—

Salicylic Acid,.....1 dram.
Powdered Starch,.....3 drams.
Powdered Soapstone,.....3½ ounces.

This powder is to be sifted into shoes and stockings.

Frequent change of hose and the drying and airing of shoes are necessary in all cases.

LICE.

These disgusting vermin most commonly appear when cleanliness is neglected, and especially in cases where the body clothing and bed clothing are used continuously without change. But there appear to be certain habits of body and certain seasons of the year which are favorable to the generation of this kind of vermin,—as, for instance, spring and autumn.

Treatment.—Wash the body well with vinegar and water, and afterwards rub in a lotion made as follows:—

Camphor, grated,.....½ ounce.
Best White Wine Vinegar,.....1 pint.
Water, ...1 pint.

Mix, and apply night and morning.

Or take equal parts of garlic and mustard, moisten with vinegar, and rub into the skin twice a day. For lice on the scalp, the most effective treatment consists in soaking the hair thoroughly, three or four times a day, with kerosene oil, and wrapping the head in a cloth for twenty-four hours. Then wash the head with green soap and hot water. Apply the ointment of ammoniated mercury. In very rare cases it may be necessary to repeat this treatment once only.

DISEASES OF SPECIAL RESEARCH.

Hookworm Disease (*Uncinariasis*). The parasite, *Uncinaria americana*, which causes this disease, was discovered in 1902. Its eggs are deposited in the intestines of the human being, but develop after they escape from the body. These larvæ pass through the skin into the blood, which carries them through the heart to the lungs, thence to the air passages, into the mouth, and on through the body. A second method of infection is through the mouth either with contaminated food or water, or from earth containing the larvæ. The malady is more common in warm, moist localities among persons living in unhygienic conditions. Physicians in southern Florida estimate that 90 per cent. of the rural population harbor the parasite to a greater or less degree; 90 per cent. is the estimate for Porto Rico. The skin, waxy-white to dirty yellow in color, becomes dry like parchment, and in the first stage itches seriously; a swelling of face, ankles, legs, or entire body may be present; anxious, stupid expression of face; prominent abdomen; finally emaciated appearance; appetite variable but abnormal; nausea frequent; muscles soft, flabby, and weak; fever usually present. Anæmia is the most pronounced symptom. For treatment thymol, male fern, and, recently, beta-naphthol, are used.

Infantile Paralysis (*Anterior poliomyelitis*). An inflammation of those parts of the spinal cord concerned in muscular movements and development. It begins suddenly and is followed by a paralysis of the muscles controlled by the nerve cells attacked, and may be transmitted to any member of a community it has once invaded. It is infectious, frequently epidemic, and rages mostly in hot weather. The germ passes into the system through the moist lining of the nose and mouth. The symptoms are difficult to determine during the period of development, which is from one to fourteen days after exposure. There is usually a slight running at the nose; the pulse is rapid and irregular, often difficult to count, and the temperature varies from 101 to 107 degrees; pains and extreme tenderness in back and limbs, the paralysis of which frequently follows in 48 hours. It is generally an acute disease, the greatest sufferers being children, one to five years old, although in 1910 there were many cases among persons much older. Data collected in Scandinavia indicate that the infection can be carried by intermediate persons to the healthy from the sick, whether slightly or seriously stricken. Massachusetts physicians have concluded that insects and dust aid in spreading the malady.

Pellagra (*Maidismus*). In Italy the cause is attributed to the use of fermented maize by the peasantry, the ones mainly affected by it. The symptoms are similar in both the acute and chronic types. In the early stage they are: redness of the skin like severe sunburn, inflammation of the mouth and stomach, severe dyspepsia, and diarrhœa; in the more advanced stages intense pains in the head and spine occur, mental depression follows, and many cases end in permanent insanity. It is rapidly fatal in the acute form, death usually ensuing in a few weeks or months. The chronic cases are milder and, according to Italian scientists, patients live from twenty to thirty years. Pellagra has been known for over 200 years. In Spain, Portugal, and Central Italy, where it is called "Italian leprosy," it is particularly prevalent. The people in these localities live largely upon maize, which is frequently harvested before it is ripe and stored in damp places, where it ferments. Whiskey prepared from this maize, as well as corn-mush, corn-bread, or polenta, may convey the poison. Alcoholism is considered by some as a chief cause of the disease. Both sexes and all ages are subject to it, but the majority of the cases occur in later adult life. In 1911 no treatment had been devised to arrest its progress.

Sleeping Sickness (*Trypanosomiasis*). It is caused by microscopic wormlike parasites called *trypanosomes*. The germ is carried by the tsetse-fly and the disease spreads in the rainy season. During the first stage, which lasts from two months to a year, occasional fever is present, the temperature varying from 99 to 102 degrees; a swelling of the lymphatic glands is another common early symptom; the second stage shows a marked change in the appearance of the victim; the facial expression is heavy and dull, all exertion is absent. This condition becomes very marked as the malady progresses; walking and all speech are difficult, and finally impossible; during the last week the patient is in a state of complete coma. Until 1908 the disease was invariably fatal. Dr. Paul Ehrlich of Germany sought and discovered in dyestuffs a specific which he called *arseno-phenyl-glycin*, which cures all animals, and is now being successfully tried upon human beings. After two injections of small doses, a definite cure is effected. This disease was first reported in 1803, but nearly a century had passed before any attempts were made to arrest it. It is confined to the equatorial regions of Africa, and affects both the white people and negroes. It is estimated that in this region within ten years fully 400,000 persons had died with it.

PROGRESS OF MEDICAL SCIENCE.

The oldest medical knowledge, the Egyptian, is found in the *Papyrus Ebers,* which dates from the sixteenth century B.C. The Babylonians had no physicians, but used incantations against disease. The Hindus were proficient in medicine and surgery very early; their influence upon Arabian medical knowledge was very great. From the *Bible* and the *Talmud* we learn of the science among the Jews, 1500 B.C. The *Vedas,* the sacred books of India, show that medicine was practiced in that country as early as the eleventh century B.C. The origin of Chinese treatment is lost in tradition. Among the Greeks and Persians the healing art was studied about 500 B.C., when Pythagoras explained the philosophy of disease and the action of medicine. The Romans learned the science at Alexandria, and carried it home to Rome.

SOME NOTABLE EVENTS AND SCIENTISTS.

Hippocrates, "the father of medicine," most celebrated physician of antiquity .....470-357 B.C.

Difference between arteries and veins discovered by Praxagoras.....335 B.C.

Herophilus founded human dissection, discovered nerves and lymphatics..300 B.C.

Erasistratus distinguished sensory and motor nerves, traced their origin and and that of veins and arteries...280 B.C.

Electricity for treatment of headache....43

Galen, the first anatomist, an authority on the pulse, author of 83 medical works still extant.....130-203

Dioscorides, author of *"De Materia Medica,"* a work still used by the Turks and Moors, lived in the latter part of the first or second centuries.

Smallpox and measles first described by Rhazes, an Arabian.....850-923

The first pharmacopœia by Avicenna, author of a famous system of medicine, *The Canon*.....1000

Albucasis wrote on surgery and performed difficult operations..... -1106

First dissection at Strassburg.....1517

Fallopius described the structure of the ear; discovered Fallopian tubes..1523-1562

Eustachio discovered the thoracic duct, the Eustachian tube, and the rudimentary valve of the heart..... -1574

William Harvey explained the circulation of the blood (1628), which made a revolution in physiology.....1578-1657

Capillary circulation, the pigmentary layer of the skin, structure of the lungs, kidneys, and spleen discovered by Marcello Malpighi.....1628-1694

Leewenhoeck discovered the corpuscles of the blood, the spermatozoa, and bacteria in the mouth (1683)...1632-1723

Hoffmann explained influence of the nervous system 1660-1742

First transfusion of blood in man.....1667

Tourniquet used at siege of Besançon..1674

Existence of septic poisons proved by Albert von Haller.....1708-1777

Inoculation for smallpox introduced into England from China.....1721

Surgery made a science by John Hunter 1728-1793

Scientific study of insanity; reformed methods for treatment, Binel...1745-1826

Cures by mesmerism by Frederick A. Mesmer 1778

Edward Jenner completed the discovery of vaccination for smallpox.....1796

First use of thermometer in disease...1797

Diagnosis advocated by Corvisart.....1808

Homeopathy by Samuel Hahnemann...1810

Stethoscope invented by Lænnec.....1816

Sir Charles Bell discovered that posterior roots of the spinal nerve cause sensation, and anterior, motion.....1816

Chloroform discovered by Guthrie.....1831

First modern germ theory suggested by the discovery of the yeast plant.....1836

Theory of contagion advanced by Henle 1840

Hypnotism discovered by James Braid..1841

Laughing gas used by Horace Wells...1844

Ether first used by Dr. W. T. G. Morton in surgical operations.....1846

Chloroform used as an anæsthetic by Sir James Simpson.....1847

Cohn proved that bacteria are plants...1853

Fermentation and putrefaction explained by Pasteur 1857

Virchow supplied the "cellular pathology" 1858

Laryngoscope perfected by Czermak and Turck 1858

Sir Joseph Lister, founder of "antiseptic surgery" (1861).....1827-1912

Osteopathy explained by Dr. Still.....1874

Inoculation for hydrophobia by Pasteur 1885

Theory of germ diseases fully adopted 1885

Laveran discovered the plasmodium of malaria 1880

Koch placed tuberculosis among germ diseases 1882

Bacillus of diphtheria discovered by Klebs and Loeffler.....1883

Bacillus of tetanus (lockjaw) discovered by Nicolaier 1884

Serum therapy generally adopted.....1889

Dr. Koch discovered lymph for checking growth of tubercle bacillus.....1890

Antitoxin for diphtheria discovered by Behring 1892

X-Rays used in medicine.....1895

Antitoxin for tetanus discovered.....1897

Erysipelas serum used by Marmorek...1902

Radium used in treatment of cancer...1908

"606," a remedy for syphilis discovered by Dr. Paul Ehrlich.....1911

Vaccination for typhoid fever compulsory in U. S. A.....1911

Spinal meningitis serum discovered by Dr. Flexner 1911

BOOK V.

WOMANHOOD AND MOTHERHOOD

MENSTRUATION.

Menstruation or the monthly flow takes place, generally, between the fourteenth and sixteenth years of age, sometimes as early as eleven or twelve. A considerable period may elapse between the first and second appearance; but, when it is properly established, its recurrence at regular periods may be calculated on with great certainty, unless some functional derangement of the system interferes with it. Ordinarily, a lunar month of twenty-eight days is the intervening period; but with some women the discharge occurs every third week. The discharge resembles blood in color, but it does not coagulate. The quantity is from three to five ounces, and the process occupies from three to seven days.

The cause of this monthly flow is the ripening and expulsion of the egg from the ovaries.

"Omne vivum ex ovo" (Every living thing comes from an egg or germ) is the universal law of reproduction. This can be shown as well in the vegetable as in the animal kingdom. The oak from the acorn, the ear of corn from the grain planted by the farmer, the robin and the elephant, all springing from germs, go to prove the truthfulness of this law. Every seed, every egg, contains a germ, which, when brought under proper influences, will produce its own kind. Thus far all is plain enough, but where do these germs originate? It has been ascertained that each animal, as well as each plant, is provided with an organ for the production of these cells or germs. In the female this organ is the ovary. The ovaries are two in number—small, oval bodies, about one inch in length, a little more than half an inch in breadth, and a third of an inch in thickness. Each ovary is attached to an angle of the womb, about one inch from its upper portion, by a ligament. The whole physiological function or duty of the ovary is to mature and deposit its ovum or egg every twenty-eighth day, from the age of fifteen to that of forty-five, or for about thirty years. This function is suspended only during pregnancy and nursing, but sometimes not even then. There are cases on record where the woman has had her courses regularly during the time she was pregnant, and there are many with whom lactation does not

interfere. During the ripening and discharge of the ovum into the canal or tube which conveys it into the womb, the generative organs become very much congested, looking almost as if inflamed. This congestion at last reaches such a height that it overflows, and produces a discharge of blood. Menstruation consists merely in the ripening and discharge of an ovum which, when not impregnated, is washed away by the menstrual blood. It will be seen that a woman can become pregnant only at or near the time of her menses. The marvelous regularity of menstruation has always excited great wonder. When we look around, we see that both animal and vegetable life have regular times at which germ production takes place. Fruits and vegetables ripen, and animals produce their young, at certain periods. It is a law of nature. Now, since we have shown that menstruation consists in the ripening and regular deposit of an egg—the flow being but the outward, visible sign of such an act—it is possible that a woman may menstruate without any manifestation. To prove this, there are many cases on record where a woman has married and become pregnant without having had the least show, which would be impossible if she did not menstruate. Again, a woman who has always been regular may have several children, without in the meantime having had any sign. This may be explained by her becoming pregnant during the time she was nursing her first child, carrying it to the full term, again becoming pregnant, and so on, until, being no longer impregnated, her courses return, and are regular thereafter.

Menstruation commences at about the age of fourteen or fifteen in this country. In warmer climates it appears earlier, and in colder ones later. Menstruation, menses, courses, catamenia, monthly periods, and "being unwell," are some of the terms by which this function is designated. The appearance of the menses before the fourteenth year is regarded as unfortunate, indicating a premature development of the organs; while their postponement until after the sixteenth year is generally an evidence of weakness, or of some disorder of the generative apparatus. If, however, the person has good health, and all her functions are regular; if her spirits are not clouded, nor her mind dull and weak, it should not be considered necessary to interfere to bring them on, for irreparable injury may be done. The first appearance of the menses is generally preceded by the following symptoms: headache, heaviness, languor, pains in the back, loins, and down the thighs, and an indisposition to exertion. There is a peculiar dark tint of the countenance, particularly under the eyes, and occasionally uneasiness and a

sense of constriction in the throat. The perspiration has often a faint, sickly odor, and the odor of the breath is peculiar. The breasts are enlarged and tender. The appetite is fastidious and capricious, and digestion is impaired. These symptoms continue one, two, or three days, and subside as the menses appear. The menses continue three, five, or seven days, according to the peculiar constitution of the woman. The quantity discharged varies in different individuals. Some are obliged to make but one change during the period, but they generally average from ten to fifteen.

It is during the menstrual period that the system, especially of young persons, is more susceptible to both mental and physical influences. Very much depends upon the regular and healthy action of the discharge, for to it woman owes her beauty and perfection. Great care should therefore be used to guard against any influences that may tend to derange the menses. A sudden suppression is always dangerous; and among the causes which can produce it may be mentioned sudden frights, fits of anger, great anxiety, and powerful mental emotions. Excessive exertions of every kind, long walks or rides, especially over rough roads, dancing, frequent running up and down stairs, have a tendency not only to increase the discharge, but may produce falling of the womb.

The quantity and duration of the monthly flow varies greatly in different women, but the regular recurrence of the flow is important to health. This should be borne in mind, and due care taken not to suppress the discharge by exposure to cold or wet, or by violent exertion of any kind about the time when it may be expected. It is desirable that young females should be properly informed by their mothers, or those under whose care they are placed, of what may be expected at a certain age, or they may be alarmed at the first appearance of the menses, taking it to be some indication of a dangerous disease or injury, and perhaps, by mental agitation, or resort to medicines, do themselves harm.

DELAYED OR OBSTRUCTED MENSTRUATION OR AMENORRHOEA.

If the menses do not appear at the usual age or for some years after, no alarm need be felt, provided there are no constitutional derangements which can be attributed to this cause. If the girl has not developed about the hips and breast, and feels not the changes peculiar to this period, it would be very injurious to attempt to force nature. If, however, she

is fully developed, and her general health suffers, a course of treatment will be necessary.

Causes.—An undeveloped state of the ovaries or womb; an impoverished condition of the blood; or the patient may be phthisical (consumptive).

Symptoms.—Unnatural heats and flushings, headache, tendency to faint, and hysterical symptoms are common, also symptoms of anæmia. (See "Anæmia.")

If the patient is consumptive there will be cough, general debility, night sweats. (See "Phthisis.")

Treatment.—If due to imperfect development of the organs of generation consult a physician. As a rule, however, but little can be done.

If due to anæmia, treat accordingly.

If due to phthisis (consumption), treat accordingly.

If there is no congenital defect of organs of generation, anæmia, or phthisis, menstruation will appear in due season.

Hot vaginal douches may be employed for the purpose of determining an increased blood supply to the parts, thereby favoring menstruation.

SUPPRESSED MENSTRUATION OR AMENORRHOEA.

Suppression is the stoppage of the menses after they have once been established. It may be either acute or chronic.

Causes.—Sudden cold, wet feet during the flow, fear, strong emotions, anxiety, or any cause that affects the general health. Chronic suppression may result from the acute, or from defective nutrition of the organs; from the early termination of menstrual functions, or from weakness occasioned by leucorrhœa.

Symptoms.—The symptoms usually present are those mentioned in delayed menstruation, but in a more aggravated form. In chronic suppression, failure of the general health, loss of appetite, pains in the head, back, and side, and constipation are the usual symptoms. At the regular periods when the menses ought to appear, there will be great excitability, and an aggravation of the above symptoms. With those of full habit, there will be a strong, bounding pulse, with acute pain in the head, back, and limbs; with the feeble, extreme languor, trembling, shivering, and pale visage.

Treatment.—A physician should be consulted and his advice followed in every particular. Where the flow has stopped suddenly from exposure, the patient may take warm drinks, salient aperients, till the bowels are opened; have hot bran poultices applied to the lower part of the abdomen; immerse the feet and legs in hot mustard water. The patient must be kept as quiet as possible. If the flow fails to appear, wait until the next period and use the hip bath a few days before the period. To the bath may be added a little mustard; and, on every occasion, active friction with dry, coarse towels should be used. Also give the following, which seldom fails if persisted in:—

Barbadoes Aloes,	1 dram.
Sulphate of Iron,	1 dram.
Powdered Cayenne,	½ dram.
Extract of Gentian,	½ dram.
Simple Syrup,	Sufficient quantity.

Mix and make into sixty pills. Dose, one pill night and morning, during and between periods, for tonic effect.

The warm hip bath should be used about the proper period of menstruation; and it would be well to given some uterine stimulant, such as a mixture composed of spirits of turpentine, made into an emulsion with yolk of an egg, and essence of juniper, about six drams of the first and one of the last, in a six-ounce mixture, one ounce to be taken three times a day. Attempts to promote the discharge in any case must not be prolonged much beyond the menstrual periods, between which all possible means must be taken to strengthen the system—good diet, plenty of active exercise, the use of the shower bath, or cold or tepid sponging are proper remedies.

If the amenorrhœa proceeds from a want of energy in the uterine organs, as is often the case after frequent miscarriages, childbearing, inflammation, leucorrhœa ("whites"), there will probably be a white discharge only, accompanied by acute pain across the flat of the pelvis, vertigo, and hysteria. Weakly young women, before the appearance of the menses, and elderly ones, at the time of cessation, or "change of life," as it is commonly called, are often so affected. In such a case aloes, good nutritious diet, and the recumbent position as much as possible during the periods.

PAINFUL MENSTRUATION OR DYSMENORRHOEA.

This is menstruation preceded, accompanied, or followed by pain.

Causes.—Neuralgia, abnormal congestion of the generative organs, closure of the mouth of the womb, excessive contraction of the mouth of the womb, new growths in the womb, displacement of the womb, or disease of the ovaries.

Symptoms.—The pain may be sharp, shooting, and shifting, or there is sense of weight, bearing down sensations in the back and flat of the pelvis, flashes of heat, a flushed face. Or there may be spasmodic, cramp-like or colicky pains, accompanied by the expulsion of membrane from the inner surface of the womb, which may be mistaken for blood clot or the product of conception, but which if floated in water shows one surface smooth, the other rough and shaggy. In all forms the pain is usually relieved when the flow becomes full and free.

Treatment.—Those cases due to obstruction to the outflow of menstrual fluids, and those due to ovarian disease, require the services of a competent physician.

Neuralgic cases, and those associated with excessive local congestion, are benefited by hot water vaginal douches, hot hip baths, hot applications externally over the region of the womb, together with the use of the following rectal suppository:—

> Extract of Belladonna,.....1½ grains.
> Cocoa Butter, a sufficient quantity to make three rectal suppositories, one of which may be inserted every four or five hours, until pain is relieved.

Should constipation coexist, a purgative dose of Epsom salts administered in a little hot water for quick effect will be of benefit.

Between periods, take plenty of fresh air and exercise, nutritious foods and tonics, such as recommended in the article on "Anæmia."

Or, one teaspoonful of elixir iron, quinine, and strychnia in a wine-glass of water may be taken after each meal.

PROFUSE MENSTRUATION.

This appears either as a prolonged or excessive period and is called menorrhagia, or as a flow occurring irregularly between the periods, known as metrorrhagia. It may be due to local disease of the womb or its appendages, or to disease of the heart, lungs, liver, etc.

Treatment.—To check the hemorrhage, the following is efficient:—

Hydrastin,.....6 grains.
Ergotin,.....12 grains.
Gallic Acid,.....36 grains.

Mix, and divide into twelve capsules and give one every two or three hours as required.

When due to disease of the womb (the most common cause), heart, lungs, etc., a physician should be consulted.

MENOPAUSE OR CESSATION OF MENSTRUATION.

Cessation gives notice that the period of childbearing is past. With females of our age and country, the courses commonly continue up to the age of from forty to fifty; sometimes they cease at about thirty-five, and in a few instances they have been known to continue up to the age of sixty. This cessation marks what is commonly termed the change of life in women, and with those of average health it occasions little or no disturbance of the general system. There may be flushings of the face, and a sense of fullness in the head, with occasional dizziness, but with those who are weak and nervous, or suffering from organic disease, we generally see a marked change at this period. With most persons the stoppage of the menses is a gradual process—the intervals become protracted, the quantity decreases, and by and by disappears; with some the cessation is sudden and complete.

THE WOMB.

This most important organ is situated in the cavity of the pelvis—from whence, when distended in pregnancy, it rises into the abdomen. It is of a flattened pear shape, and is held in its place by elastic ligaments. In its natural state it is about three inches in length by two in breadth across the broadest part, and one in thickness. At the period of puberty it weighs about one and a half ounces; after parturition, from two to three ounces; and in the ninth month of utero-gestation, from two to four pounds. It is supplied with glands, vessels, and nerves, the latter of which constitute an extensive network over its entire surface.

The ovaries are two in number—one on each side of the uterus. They are nearly as large as the male testicles, and perform a corresponding function. When the egg (or ovum) has been perfected in the ovary, it is seized by the extremity of one of the Fallopian tubes, and conducted to the uterus.

FALLING OF THE WOMB (PROLAPSUS UTERI).

This is the falling of the womb from the weakening of its supports, and the pressure of the viscera above, generally increased by tight lacing and the pressure of the clothing sustained by the abdomen. Constipation, and the daily effort to dispel the contents of the rectum and straining, aid in the production of this trouble. An abnormally large pelvis, pregnancy, and the weight of tumors, abdominal dropsy, violent coughing, and the relaxation of the vaginal walls, all tend to produce this downward displacement.

Symptoms.—Severe pain, sometimes hemorrhage and bearing down sensations; pain at the back of the head; backache, and aching loins; frequent passing of small quantities of urine; constipation; whites (leucorrhœa); irregular, scanty, or profuse and painful menstruation; sterility.

Treatment.—This can be instituted only by a physician.

The womb is also liable to fall either backwards (*Retroversion*) or forwards (*Anteversion*), but the treatment of these conditions must be confided to an experienced physician.

CANCER OF THE WOMB.

Symptoms.—Sudden, shooting pain through the abdomen, which disappears entirely, or leaves after it a dull aching or gnawing sensation, accompanied by discharge of a fluid which is sometimes pale and thin, but soon becomes thicker, yellower, perhaps streaked with blood, and very offensive, is suggestive of cancer. This pain is gradually rendered more severe and almost constant, and an exhausting hemorrhage sets in, perhaps continuing until checked by fainting. In other cases, a burning heat, followed by a fetid discharge of matter which is mixed with streaks or spots of blood, is experienced.

Treatment.—Cleanliness, fresh air, plain, nutritious diet, regulation of the bowels, and tranquillity of mind, are all that can be recommended in a work like this. The woman who has the misfortune to be visited with this affection must resolutely determine to retire from the active duties of life, and abstain from indulgences which would excite her passions and increase the circulation of blood. Bland, soothing nourishment, and local applications, are all that can be administered until she can have judicious and experienced medical assistance. Her bowels should be kept open; the fetid and erosive discharges should be

washed away by antiseptic injections as carbolic acid water or creolin—one teaspoonful to every quart of warm water.

POLYPUS OF THE WOMB.

When a woman has been wasting away for some time with copious hemorrhages, and the remedies recommended under the head of "Flooding" have been faithfully but unsuccessfully tried, there is great reason to suppose that she has a polypus, and medical advice should be at once procured. Formidable as the last two diseases are, they are not always beyond the reach of surgery. An operation is imperative.

The ovaries, uterus, and Fallopian tubes are so closely connected in situation and function that they are generally inflamed together. The cause may be weakness, causing a local determination of some general disturbance, such as cold or irritation of these organs. It usually follows childbirth, abortion, or excessive and violent sexual intercourse.

ULCERATION OF THE NECK OF THE WOMB.

Ulceration of the neck of the womb is produced by corroding discharges and the irritation of continual sexual intercourse. It is readily cured by abstinence, vaginal injections, and direct application to the parts of a strong solution of nitrate of silver once in five or six days; or by the ulcers being touched with solid nitrate of silver once in five days.

FLOODING (UTERINE HEMORRHAGE).

This commonly occurs after abortion or labor, or it may be occasioned by disease of the womb. Immoderate flow of the menses is also called flooding, and to this some women are very subject. It is extremely weakening to the system and therefore should be checked as soon as possible.

Treatment.—The best treatment is perfect quiet, and astringent and tonic medicines like the following:—

Tincture of Sesquichloride of Iron,.....2 drams.
Infusion of Quassia,.....6 drams.

Mix, and take a tablespoonful every four hours. If there is much pain and irritation, add tincture of conium, or hyoscyamus, two drams. (See treatment of "Profuse Menstruation.") Should this not have the desired effect, consult an experienced physician, as there is reason to fear disease of the womb.

INFLAMMATION OF THE OVARIES (OVARITIS).

This disease is characterized by pain, heat, swelling, perhaps redness, in one or both groins. It is to be treated as any other inflammation—sitz baths, with rest, and a strict diet. The bowels must be occasionally opened by a gentle aperient, as castor oil. Injections of tincture of belladonna and hyoscyamus are very useful and soothing.

INFLAMMATION OF THE WOMB.

The treatment is much the same, with the addition of local treatment of the inner surface of the womb, which must be directed by a physician, after thorough examination.

WHITES (LEUCORRHOEA).

There is no disease so common among women as this complaint. Few married women, particularly if they are mothers, escape its attacks. Very generally this troublesome discharge is associated with general debility, especially if profuse for any length of time. Hence it is very desirable that attention should be paid to it at the commencement; for, if neglected, it may seriously impair the constitution.

Causes.—Over-exertion and irritation of the uterine organs. It may also be brought on by diarrhœa, piles, worms, irritation of the bladder or of the nervous system, excessive sexual intercourse, miscarriage, abortion, and displacement of the womb. Weakness, too, is a cause as well as a consequence of this affection; confinement in a warm atmosphere and luxurious living must likewise be numbered among its exciting causes.

Symptoms.—In leucorrhœa the discharge is commonly white and thick. After a while the color will perhaps change; sometimes the discharge will become very acrid, causing abrasion and smarting. In this stage it is apt to cause a gleety discharge from the urethra of one having sexual intercourse with the patient. Ere long, if the disease is not checked, we get great local irritation and constitutional disturbances: there will be costive bowels, pains in the loins and back, great lassitude, with nervous and hysterical affections. Menstruation, too, will be irregular, at times altogether suspended, and at others profuse.

Treatment.—If the patient is of full habit, saline aperients should be taken, and a spare diet observed; local ablutions should be practised three or four times a day, using occasionally a decoction of

poppies for the purpose; the hip bath, and an injection of alum and water, with a scruple of powdered opium in each pint, will also be found serviceable. The recumbent position should be preserved as much as possible, and the parts kept cool. Local treatment will be of little avail in cases of long standing unless the general health be attended to. To keep the bowels open, take five grains of compound rhubarb pill as often as required; and to strengthen and cool the system the following mixture:—

Sulphate of Iron,.....12 grains.
Diluted Sulphuric Acid,.....1 dram.
Sulphate of Magnesia,.....3 drams.
Cinnamon Water,.....12 ounces.

Mix, and take two tablespoonfuls two or three times a day.

Local treatment:—

Zinc Sulphate,.....1 ounce.
Acetate of Lead,.....1 ounce.

Mix; one teaspoonful in two quarts of warm water as a vaginal douche morning and night.

Or:—

Borax,.....4 ounces.
Baking Soda,.....8 ounces.
Chlorate of Potash,.....4 ounces.

Mix; two level tablespoonfuls in two quarts of warm water as a vaginal douche twice daily.

Or, mucol, a teaspoonful to a quart of water twice daily as a vaginal douche.

Women who have leucorrhœa should avoid all predisposing causes, such as wines and other stimulants, luxurious living, and sensual indulgences of all kinds, especially, and anything which has a tendency to enervate and enfeeble the frame. Early rising and regular open-air exercise, warm and comfortable clothing, good food and tonic medicine, with the use of the shower bath and bathing—these will prove the best preventives.

PRURITIS VULVAE.

This term designates a condition characterized by excessive irritation and itching of the external genitals. It may be due to uncleanliness, general debility, anæmia, disorders of digestion, diabetes, diseases of the uterus, and change of life. Pregnant women frequently suffer from it.

Treatment.—Strict cleanliness, hot water douches, and the parts should be bathed with black wash (one dram of calomel to a pint of limewater) or baking soda, or borax, one dram to a pint of cold water, or the following ointment may be applied:—

Salicylic Acid,.....15 grains.
Thymol or Ichthyol,.....1½ drams.
Vaseline,.....1 ounce.

Mix, and apply as required.

If the itching becomes very intense the application of a nitrate of silver solution (ten grains to the ounce) may be required. This should be used very carefully. The tissues turn dark on application of the last solution.

Alkaline waters are sometimes of benefit, such as alkalithia—a teaspoonful of which may be administered one to three times daily in a glass of water half an hour before meals to render the urine bland and non-irritating.

General Tonic Treatment.—Elixir iron, quinine, and strychnine, one teaspoonful in a wineglass of water after each meal.

Or, Phillips' Phospho-Muriate of Quinine, one teaspoonful in a wineglass of water after each meal.

MOTHERHOOD.

PREGNANCY.

Utero-gestation, or the period from the time of conception to that of delivery, extends over a space of forty weeks, or two hundred and eighty days. In making the necessary provision for the coming of labor, it is best to count back three calendar months from the date of the last menstruation and add seven days; for example: if menstruation appeared June 16, count back three months to March 16, and add seven days, which would make March 23 the probable date of confinement.

If conception takes place while the woman is nursing, the day of delivery can be approximately estimated by the size of the abdomen, but this is a very unsatisfactory method. A better plan is to note the appearance of quickening (fœtal movements), which is felt usually about the middle of pregnancy (the end of the twentieth week), and count the day of delivery to be between twenty and twenty-one weeks later.

The Signs of Pregnancy.—Three positive signs may be noted at

OBSTETRICAL TABLE.

By W. W. Ely, M.D., Rochester, N. Y.

January..	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	*November.*
February..	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28				
November..	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5				*December.*
March.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
December..	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	*January.*
April.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
January...	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4		*February.*
May.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
February..	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	*March.*
June.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
March.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6		*April.*
July.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
April.....	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	*May.*
August....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
May.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	*June.*
September	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
June.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7		*July.*
October...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	*August.*
November	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
August....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6		*September.*
December.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
September.	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	*October.*

the end of the fourth lunar month or later. They are: (1) quickening; (2) hearing the fœtal heart-beat (the listener's ear being applied to the woman's abdomen), only a trained ear can detect it; (3) the ability to trace the outline of the fœtus through the abdominal wall.

Other signs of pregnancy, termed "doubtful signs," are:—

1. *The Cessation of the Menses.*—This is by no means an unfailing sign, for sometimes this discharge will cease from other causes, and sometimes it will continue after conception has taken place.

2. *Morning Sickness.*—This generally commences about the fourth or fifth week and lasts to about the fourth month. With some this is but slight and causes little inconvenience; but with others it is more continuous and serious, sometimes causing the rejection of nearly all food for a very considerable period. This symptom, again, cannot be taken as a proof of pregnancy; it is merely a suspicious circumstance, to be watched in connection with others.

3. *Dyspepsia and Cravings.*—The woman's appetite is capricious, and she may long for peculiar articles of diet or those out of season.

4. *Enlargement of the Breasts.*—They generally increase in size about two months after conception. They also become tender and sore; they throb and burn, and, when pressed by the hand, have a hard, knotty feeling, in consequence of the swelling of the glands by which the lacteal fluid is secreted. The nipple, also, becomes more prominent, and increases in diameter, while the areola around it assumes a purplish tinge, and has on it several little raised pimples of a yellowish white color.

5. *Enlargement of the Womb and Abdomen.*—In the fourth month, this becomes very perceptible,—the womb, which may now be felt as a firm, rounded body, having ascended above the pubes, and pushed the bowels up into the abdomen.

6. *Bladder Disturbances.*—Urine is voided more frequently owing to pressure on the bladder. This condition is relieved after the fourth month as the womb rises out of the pelvic cavity into the abdominal cavity. It reappears during the last month of pregnancy when the womb with its contents sinks into the pelvis.

7. *Changes in the Skin Covering the Abdomen.*—There may be a slight brownish discoloration of the skin around the navel and extending downward, and similar brownish patches may appear on the forehead, face, and neck. These disappear after confinement. Where the abdominal skin is stretched, white lines appear and remain after confinement.

Conduct During Pregnancy.—A pregnant woman should be aware that the advantages obtained by well-regulated habits are by no means exclusively conferred on her, but that others equally important are likewise conferred on the child, for whom a larger supply of nutrition, and of a better quality, will thus be provided; and so its career of life will commence strong, vigorous, and less liable to those morbid debilities and derangements which affect the children of the indolent, the pampered, or the debauched.

From the moment, therefore, that conception has taken place, a new and most sacred duty devolves upon the female. She is bound by all the ties of maternal sentiment, of humanity, and of moral and religious obligations, to protect the being in her womb against every circumstance, under her control, which might have an unfavorable influence on its delicate organization.

Diet During Pregnancy.—The peculiar tendency to irritation in pregnancy renders it especially proper to avoid undue excitement. Moderation and simplicity of food are especially proper in this case. As the appetite is frequently very craving during this period, an inordinate indulgence in rich and high-seasoned food is among the most common errors; and this mistake is the more readily fallen into from the erroneous idea which many entertain, that, as the fœtus draws its nourishment from the maternal system, a greater quantity of aliment is required in pregnancy. The exercise of caution in the selection of proper food appears to be particularly important towards the termination of gestation. When the stomach is in a weak and irritable state, oatmeal, the lean part of mutton, tender beef, soft-boiled eggs, and stewed apples constitute appropriate articles of nourishment. But it is always to be recollected that the temperate use of food is of more consequence than the selection. Coffee and tea may be moderately used; but alcoholic drinks should be studiously avoided. The temptation to indulge in small potions of cordial, or brandy, in the early months of gestation, is often very strong; but it ought to be firmly checked, or the deplorable habit of solitary dram drinking may be the result of indulgence.

The sensibilities of the stomach, in some instances, undergo extraordinary derangement, especially in weak and delicate women. Articles of food, which, previous to pregnancy, were very grateful and congenial, become highly disagreeable, and an almost irresistible craving for singular and even disgusting substances is experienced. This remarkable irregularity of the appetite is usually called *a longing*. If the substances

longed for be not evidently of an injurious character, they should not be withheld; in some instances, these longings may be regarded as instinctive calls of the stomach for articles favorable to the health of the individual. Thus, when a strong desire for eating chalk, charcoal, or clay is manifested, we are admonished that the digestive powers are feeble and that there is a tendency to acidity in the stomach. In such cases the means of relief are alkalines, mild laxatives, and tonic vegetable bitters.

Dress and Exercise.—The custom of wearing corsets during gestation cannot be too severely censured. It gives rise to functional disorder of the stomach and liver, as well as to uterine hemorrhage and abortion in the mother; it likewise impedes the regular nourishment of the fœtus in the womb. The clothing should always be sufficient to protect the body against the injurious influence of cold; the abdomen and feet especially should be guarded against injury from these causes. In winter, or cold and damp seasons, the use of a flannel bandage or roller around the abdomen will be found very beneficial and comfortable. All kinds of agitating exercise, such as riding in carriages with rapidity over rough roads, dancing, lifting or carrying heavy loads,—in short, all masculine and fatiguing employment whatever,—ought to be avoided by pregnant women; and the more so as gestation approaches the term of its regular completion. During the eighth and ninth months of pregnancy unusual exertion or fatigue is particularly apt to excite premature labor. Riding in an easy carriage on even roads, or moderate walking, may be enjoyed with great propriety, and usually with obvious advantage during gestation.

Moral Influences.—Tranquillity and cheerfulness of mind are of prime importance during pregnancy. Convulsions, severe hysteria, spasms, syncope, hemorrhage, and abortion may be produced by violent anger, terror, or jealousy, during pregnancy. Intense grief will occasion debility, indigestion, jaundice, and various other functional disorders. A strong excitement of the imagination is supposed by some to be capable of producing impressions on the fœtus in the womb.

The Breasts.—The breasts and nipples should be particularly attended to during the latter months of gestation, in order to prepare them for suckling the infant. For some weeks before the expected termination of gestation, the nipples should be daily washed with lukewarm water, then dried by exposing them to the free air, and afterwards gently rubbed for five or six minutes with a soft piece of flannel,

or with the extremities of the fingers. When the skin of the nipples is very delicate and sensitive, they may be washed with brandy and water, or a wash composed of two drams of the tincture of myrrh, one dram of laudanum, and two ounces of water. In using this, the nipples should be first bathed with lukewarm water, and dried and rubbed as before directed, and then washed with the lotion. Compression of the breasts by corsets, or any other artificial means, is carefully to be avoided. When the nipples are very small, or sunk in the breasts, they should be drawn out by means of a suction pump or with a common clay tobacco pipe. This process should be repeated several times daily, until they have acquired a sufficient degree of prominency.

Care of the Teeth During Pregnancy.—To insure in a child a clear mouth full of strong teeth, we should begin with the expectant mother. She must bring herself into as perfect a physical condition as possible by not violating the laws of nature regarding diet, rest, sleep, and fresh air. She must have plenty of fresh air and moderate exercise, sleep well and long enough; she should chew her food slowly and thoroughly, eat a generous mixed diet, not forgetting that baby must have bone salts from which to form its bones and teeth, for very soon after the beginning of pregnancy there is being created a more than normal demand upon the system of the mother for these bone forming elements. Now the question arises, "Where must they come from?" Noted physiologists, by a careful study of the chemistry of the tissues, have presented to science many important data, concerning, among other things, the influence of our diet upon the formation of various tissues within our bodies, and it is only comparatively recently that they have satisfied themselves that in order to supply the wants of the system the food must consist of a combination of elements which are represented in the tissues, so that for the elements required in the baby's system we must look to the diet of the mother. Hence, if we wish to harden baby's bones and present it with a good set of teeth, which will not be too chalky and brittle and will have the natural elements of good tooth structure to resist decay, we must give it a good inheritance to such conditions by incorporating into the mother's food the elements of bone formation in some form or other, whether it be in the form of medicine or in the articles of food she should take.

Many cases of deficient nutrition in pregnancy are treated by supplying the system with the required elements in a medicinal form, but

as nature provides these in abundance in many articles of food, in a form far more palatable than medicine and yet far less expensive, we can conceive of no need in the average case of anything but good judgment in the diet given.

When we know that an analysis of bone reveals principally the phosphate and carbonate of lime, with the chloride of sodium and phosphate of magnesia present in small quantities as its inorganic or mineral (earthy) matter, and that it is this which we are particularly desirous of in the structure of our teeth, we shall then have to assume that unless we introduce plenty of these bone forming elements into the system of the mother to supply this want, they will be taken from the mother's bones—to the harm of the mother.

As want of space prevents us from noticing the different foods which yield the individual salts, it will suffice to say that it is the phosphate of lime to which bone owes its firmness and hardness, and this salt occurs in combination most abundantly in any of the cereal preparations which are made from the whole kernel of wheat, oats, or rye; but preëminent among useless, yes, destructive, foods, and that for which there is so little compensation for the eating, is *common* white flour, for the gluten, which is the life-giving principle of the wheat, is entirely left out of this foolishly fashionable white flour, and it is time we were considering the consequences, as it is cruel to feed our children upon so imperfect food, for a child deprived of lime phosphates in its foods will have rickets, curvature of the spine, and loss of teeth; and an adult eating an excess of starch in the form of fine white flour has gout, rheumatism, and obesity, with early loss of teeth. A person, young or old, subsisting chiefly upon pies and cake and other fancy pastry and desserts, as is the case in many well to do families that boast of good living, loses his teeth in spite of eternal vigilance and most skillful dentistry, but still people scoff at dietary reform and blame the dentist and the Creator for their imperfect teeth. Why not, then, adopt the wholesome loaf of whole wheat bread, which contains four times as much proteid matter as an equal weight of white bread, place it upon your tables, and the children will soon convince you that it is a wholesome, healthful, natural food, and to your own taste all other breads will soon seem flat and unsatisfying?

We find alkaline, phosphates, and other soluble salts in meat, eggs, milk, etc.; also many articles of the vegetable kingdom might be added as a typical diet, to the exclusion of too much pastry cooking.

And just now a word in regard to the mother's teeth at this period.

It is an old but very true saying that for every child a tooth, and many practitioners will be ready to even more than substantiate this statement by saying that for some mothers the birth of even one child has been the starting point for the loss of nearly all the teeth they have, for the disturbances of nutrition during pregnancy often cause an acid condition of the mouth and a very highly inflamed condition of the mucous membrane, sore and bleeding gums, while at times so very painful does this condition become that the thorough cleansing of the teeth is made impossible, and the food stuffs remaining around about the necks of the teeth undergoing the process of fermentation and acid formation, also making a feeding ground for bacteria, which under such favorable conditions of heat and moisture grow, thrive, and multiply in untold numbers, render in turn a still further acid condition by their waste products, producing a most favorable condition in all for the destruction of the teeth.

We have, then, first of all, to prepare the mother's mouth to resist these conditions and avoid suffering by a visit to a good dentist, who, with a knowledge of the conditions, will with the least possible inconvenience to the patient put the teeth into a condition to insure comfort for this period. Failure in this measure may result in a great deal of suffering, for it is during this time that such disturbances as will necessarily arise will be, by the reflex nervous mechanism, referred to any diseased tooth along the path of the fifth nerve (which supplies the teeth). Oftentimes these conditions give rise to a severe toothache for several hours where there are no diseased teeth in the mouth.

The teeth being in good order, we must now watch the saliva and keep it neutral (neither acid nor alkaline in reaction). A convenient test for such conditions can be made by the use of litmus paper, which can be had in any drug store, made in two colors, red and blue. By touching this paper to the tongue when moist with saliva, if it be acid the blue paper will be turned red in color; if alkaline, red will be turned blue by this test.

This acid condition may be locally corrected by the use of slightly alkaline mouth washes. The one most often recommended by dentists is called milk of magnesia (Phillips'), and in case of inflamed gums, as referred to above, any good antiseptic mouth wash might be of service, among which may be mentioned boro-lyptol, listerine, pasturine, and glyco-thymoline; but where gums are very soft and spongy a more

astringent wash is necessary to harden and shrink the gums, such as the following prescription calls for:—

Tannic Acid,.....1½ drams.
Iodide Potassium,.....12 grains.
Tincture of Iodine,.....1 dram.
Tincture of Myrrh,.....1 dram.
Rose Water,.....6 drams.

Dissolve the tannic acid and iodide of potassium in the rose water and add the tinctures, then strain.

Use one teaspoonful of this to one-half glass of warm water twice daily as a mouth wash.

Should this wash not relieve the condition it is because its use is too superficial to reach the seat of the trouble, which has been of so long standing that it will require some prophylactic treatment by a dentist, who can render no greater service to humanity in any way than in the thorough cleansing of the teeth under the free margins of the gum and in such places as the patient cannot reach by the use of the tooth brush. And while many have listened to the careful warnings of our elders, never to enter the dental office for any dental services while in a pregnant condition, a consensus of opinion of best authors tells us that in these days, with modern facilities for relief rather than for torture, in the hands of a good, careful dentist, it is better for the patient's general condition to have dental work of necessity done in a temporary way than to suffer the consequences which follow the neglect of such services when needed. For to maintain a cheerful attitude, which is desired above all, during pregnancy, as there is no tonic which will keep up the general tone of the system like peace of mind and happiness, would be just as hard to do while under the depressing influence of a few growling teeth, as it would be for us to live up to all the teachings of the Bible.

Now, reasoning from a most rational conclusion that as, first, all plant and animal life must draw its nourishment from sources containing in sufficient quantity their physical constituents, as animals it is evident that we develop and subsist solely upon such substances as are taken into our bodies. With this fact made clear, it is plain that such foods must contain in definite proportions precisely the chemical elements of which our bodies are composed, or perfect development is impossible. It is also plain and reasonable to suppose that if these laws be kept with fairly good judgment, we may expect, under normal

conditions, to have a well born, healthy child, fully developed and well rounded, with sound tissues and plenty of vitality,—the realization of every mother's fondest hopes.

DISEASES OF PREGNANCY.

MORNING SICKNESS.

This complaint is sometimes very troublesome and obstinate.

Treatment.—The patient should have breakfast in bed, and remain in a recumbent position for some time after. Small lumps of ice put into the mouth and allowed to dissolve will sometimes give relief. Give, if the sickness is troublesome, three times a day, a mixture composed of one scruple of bicarbonate of soda, dissolved in a wineglassful of water, to which add a tablespoonful or two of lemon juice. Drink while effervescing.

The following will also be of service:—

Bismuth Subnitrate,.....80 grains.
Dilute Hydrocyanic Acid,.....16 drops.
Cinnamon Water,.....to make 1 ounce.

Mix, and take a teaspoonful every two hours until nausea and vomiting are relieved.

CONSTIPATION.

During the latter months of pregnancy constipation is nearly always present, the pressure upon the lower bowel being the cause. Violent cathartics should not be taken. A moderate dose of castor oil may be administered about every other day, or as often as necessary; but if the stomach nauseates at repeated doses of this, try the following mixture:—

Sulphate of Magnesia,.....1 ounce.
Infusion of Roses,.....6 ounces.
Cinnamon Water,.....2 ounces.

Dose, a wineglassful every morning early.

Or:—

Maltzyme with cascara, or maltine with cascara, may be taken on retiring, in one-half to one teaspoonful dosage.

Or:—

Sharp and Dohme's Pil Lepactic, one or two pills on retiring.

HEARTBURN.

This may be removed by moving the bowels with a little magnesia, and taking a wineglassful of limewater in milk two or three times a day; or carbonate of magnesia, ten grains, in cinnamon water, with one dram of tincture of gentian; or a tablespoonful of Phillips' milk of magnesia in a like amount of water will frequently relieve this condition.

INCONTINENCE OF URINE.

The frequent desire to urinate is most frequently due to pressure upon the bladder; sometimes, however, the condition is due to nervousness. In any event one tablet of cystogen in a glass of water three times a day will afford relief.

Or:—

Formin,.....160 grains.
Peppermint Water,.....2 ounces.

Mix. A teaspoonful three times daily in a wineglass of water will be beneficial.

Or:—

Alkalithia, one teaspoonful in a glass of water one to three times daily one-half hour before meals.

Owing to the frequent occurrence of diseases of the kidney during pregnancy and the serious consequences attending the same, no pregnant woman should neglect to send her physician a sample of morning urine once a month for the first seven months, twice during the eighth month, and *each* week during the last month, that he may determine the presence or absence of kidney trouble. Nor should she neglect to inform her physician should she suffer persistent headache, disturbances of vision, persistent constipation, puffiness of the face, swelling of the feet, scanty flow of urine, or hemorrhage from the vaginal tract however slight.

Shame, or delicacy, should not prevent the woman from disclosing to her physician the fact of any past or present local infectious disorder of herself or husband. Strict attention to these suggestions may save her, and her as yet unborn child, serious affliction and even life.

COUGH AND SHORTNESS OF BREATH

may occur during the early months of pregnancy. A soothing cough

mixture will benefit the cough, but, if it is persistent, the following frequently affords relief:—

Oil of Sandal Wood,.....2½ drams.
Emulsion of Almonds,....enough to make 4 ounces.

Mix. One dessert-spoonful three times daily.

Or:—

Codeine,.....2 grains.
Dilute Hydrocyanic Acid,.....16 drops.
Spirits of Chloroform,.....3 drams.
Glycerine,.....3 drams.
Syrup of Wild Cherry,.....to make 2 ounces.

Mix. A teaspoonful in water every three or four hours.

During the latter part of pregnancy, owing to the enlarged uterus pressing upward, there may be shortness of breath and cough. Relief may be obtained by using above mentioned remedies, but the condition usually persists until the womb sinks into the pelvis or until the child is born.

PRURITIS VULVAE OR ITCHING OF THE EXTERNAL GENITALS.

This has already been described in the chapter on "Womanhood" (page 471).

INSOMNIA OR SLEEPLESSNESS.

A cup of hot malted milk on retiring, a warm bath, or a hot foot-bath will frequently induce sleep. If this is not sufficient the following will be of service:—

Potassium Bromide,.....3 drams.
Fluid Extract of Valerian,.....6 drams.
Simple Elixir,.....to make 3 ounces.

Mix. Take a dessert-spoonful in a little water one hour before retiring.

MELANCHOLY, DESPONDENCY, ETC.

Despondency frequently seizes upon those who are about to become mothers; but generally, if the health be pretty good, it is shaken off as the great trial approaches. There are some women who are never so well and cheerful as during the time of pregnancy, but there are many to whom it is indeed a period of trial and suffering; and

especially is this the case with those who are about to become mothers for the first time. If it is apparent that the mental condition is becoming serious, treatment should be instituted.

Treatment.—Keep the bowels open with some simple aperient, such as Hunyadi water or Apenta water, administered half an hour before breakfast.

The diet should be light, nutritious, and easily assimilable.

To quiet the nervous system the combination recommended above for insomnia should be given two or three times daily as required.

A change of environment is advised. The patient should take a due amount of exercise in the open air daily, and her surroundings should be cheerful.

VARICOSE VEINS.

For cramps and pains in the legs, with swelling and varicose veins, sponge the legs with cold vinegar and water, and put on roller bandages or elastic stockings, and rest in a recumbent position.

HEMORRHOIDS OR PILES.

After each movement of the bowels, the parts should be bathed with cold water, dried and bathed with witch-hazel, and afterward anointed with:—

Ointment of Nutgall,.....1 ounce.
Ointment of Stramonium,.....1 ounce.
Ointment of Belladonna,.....4 drams.

Mix. Apply locally and insert a little within the anus.

Or:—

Iodosyl suppositories, No. 12. Insert one on retiring.

The bowels should be moved daily by the use of some simple aperient, Hunyadi water or Apenta water, half an hour before breakfast.

Or:—

Pil lepactic, No. 12. One on retiring.

FALSE PREGNANCY.

A condition frequently observed about the turn of life. The catamenia become irregular, previous to their final cessation, or are suppressed for a few periods; at the same time nausea or vomiting is experienced, the breasts enlarge, become sensitive or even slightly

painful, the abdomen grows fuller and more prominent, distention of the intestines by flatus communicates a sensation like that produced by the motion of a fœtus; the nervous system is generally much disturbed, and the woman feels convinced that she is pregnant, an idea which, at the time of life alluded to, is cherished by the sex with an extraordinary devotion, and relinquished with proportionate reluctance; and not infrequently at the end of the supposed gestation, the delusion is rendered complete, and almost assumes the character of a reality, by the occurrence of periodical pains strongly resembling labor.

ABORTION OR MISCARRIAGE.

The premature expulsion of the fœtus from the womb,—that is, before the seventh month. After that period, if delivery occurs before the ninth month, it is called premature labor.

Causes.—A sudden shock to the system by a fall or a fright; straining, or overreaching; the administration of strong purgatives or emetics; sexual indulgence, or aught which may tend to debilitate the system; malformation of the generative organs; fevers and severe inflammations; syphilis or constitutional disease of any kind; the growth of polypi or tumor in the cavity of the uterus, or adhesion to the surrounding viscera; and too great contractibility of the uterine fibers and blood vessels may cause miscarriage. Frequently a diseased condition of the fœtus itself causes miscarriage. Two classes of females, very different in constitution and appearance, are liable to abortion, namely, those of a plethoric habit, and those in a weak and irritable condition. Those who continue to suckle after conception has again taken place render themselves liable to it, because a certain amount of nutriment required by the fœtus goes to the formation of the lacteal fluid.

Miscarriage is generally attended with much pain. It weakens the system, and often severely tries the constitution of the sufferer, whose liability to the accident increases with each occurrence. The periods at which it is most likely to take place are said to be about a month after conception, again in twelve weeks, and again in the seventh month,—the liability increasing in those stages which correspond with the periods of menstruation. Some women invariably miscarry at a certain stage; and thus, although often in the way to become mothers, are never blessed with offspring.

By this it will be sufficiently plain that pregnant women ought to

avoid all violent exercises of the body, strong mental excitement, over-indulgence of sensual appetites, exposure to wet, or any extremes of weather, or aught which may tend to constitutional derangement of whatever kind; and those who have once aborted should be doubly careful on account of their greater liability.

Symptoms.—These vary considerably, according to the stage of pregnancy, but usually there are slight pains in the loins and parts about the womb. There is a sense of bearing down, a frequent desire to make water or to evacuate the bowels, and a feverish state of the system generally. A discharge of blood commonly follows, sometimes in clots, at others in gushes; and this will continue until the fœtus is expelled. As the patient cannot be considered out of danger until relieved of the ovum, the discharge ought to be carefully watched, and preserved for the examination of the medical man, should he not be present during its progress, which is much to be preferred.

Treatment.—The first object when the premonitory symptoms above mentioned set in, is, if possible, to *prevent* abortion. To this end the patient must at once assume a recumbent position, and on no account be suffered to move more than may be absolutely necessary. She should be covered with clothing sufficient to keep her warm but not overheated, and a pillow be placed under the hips. Forty or forty-five drops of laudanum in six tablespoonfuls of starch water should be injected into the rectum, or a suppository containing one-half grain of extract of opium may be inserted into the rectum to quiet the uterine contractions. The bowels should be moved gently by such simple laxatives as Seidlitz powder, citrate of magnesia, Apenta water, Hunyadi water, castor oil, a glycerine suppository inserted into the bowels, or the administration of a simple soap and water injection should the opiates cause constipation. If these measures fail the abortion is no doubt inevitable and a physician had better be summoned, whose efforts will be directed to the relief of pain, prevention of exhaustion, and finally the removal of the uterine contents.

The best preventives of miscarriage are the frequent use of the cold hip bath, and sponging the lower part with cold water; strict attention to diet, and avoiding all violent purging medicines; moderate, gentle exercise, and entire abstinence from sexual intercourse during the first months of pregnancy.

About abortions voluntarily produced, we can only warn women of the folly and danger of resorting to unprincipled empirics, or the use of powerful drugs. Death frequently results from the employment

of such means as are necessary to produce abortion, and it is far more honorable to bear the shame and disgrace of being the mother of illegitimate offspring than to incur the risk and sin of destroying your own and another life.

Women in wedlock have positively no excuse for violating the parental instinct or wishing to commit so base a crime.

PREMATURE BIRTH.

A birth which occurs between the seventh and ninth month of pregnancy is called premature. It is a contingency to be most carefully guarded against, for a child born before its regular time can scarcely be expected to have the strength and vigor of one which attains its full development in the womb. Nevertheless cases have been known in which the early-born child has grown up hearty and strong, and there are also cases in which, for the mother's sake, a premature labor is desirable, as giving the only possible chance of producing living offspring at all. Of course, none but a physician should be intrusted with the delicate task of bringing about a premature labor, and only malformation of the pelvis (deformity), or serious disease of the heart or kidneys, justifies the procedure.

CONFINEMENT OR PARTURITION.

Few women who are near their confinement are sufficiently cautious of exposing themselves to unnecessary fatigue and atmospheric changes. Take only gentle exercise, and avoid getting wet, chilled, or heated in crowded assemblies. Miscarriages, difficult labors, and frequently lasting injury to mother and child, if not death of one or both, are not infrequently the results of imprudence at this critical period. Therefore we impress upon all our readers who are likely to become mothers, the duty which they owe to themselves, their friends, and their future offspring, and advise them to refrain from the exciting pleasures and laborious occupations of life.

Let all the preparations for the little stranger be made in time, and the services of an experienced nurse engaged. Let the mother, or some female, be at hand to aid, counsel, cheer, and encourage, not only at the actual period of labor, but for some time previously. And let the mother in expectancy be treated with all possible love and gentleness. She may be fidgety and whimsical,—let her whims be indulged. She is fre-

quently in a state of great nervous excitement,—let her be soothed and dealt with tenderly.

Preparation of the Bed and Patient.—Cover the mattress with a rubber sheet and over this place a cotton or linen sheet, fastening both securely with safety pins. A second rubber sheet is then placed across the middle of the bed and covered with another cotton or linen sheet. On top of these and under the woman's buttocks place a pad (one yard square and three inches thick) of cheese cloth or other material padded with cotton. This pad receives all discharges.

When labor is completed this pad, together with the upper rubber and cotton sheets, are removed and the patient rests on a dry, clean bed.

The patient's bowels should be emptied by means of soap and water injection or a glycerine suppository, and urine voided before she goes to bed. An empty bowel and bladder facilitates labor. When the patient goes to bed her nightdress should be rolled up above the small of the back to prevent soiling, and the abdomen and thighs be covered with a small sheet.

We will suppose that the inevitable hour has come, and that the labor pains are regular, and that delivery proceeds properly, although perhaps slowly. If she be a strong, healthy woman, and no unusual complications arise to disturb the natural process, but little aid or interference may be required. There will be the usual warning symptoms: intermitting pains in the back, slight at first, but increasing in intensity. There will probably be a slight discharge of mucus, stained with blood, and perhaps also a considerable discharge of a clear fluid, popularly called "the waters." This is an albuminous liquid filling up the membrane in which the fœtus floats, and so preventing pressure. It sometimes does not escape until labor has actually commenced by the falling down of the child into the pelvis. When this takes place, the recumbent position should be assumed. Previous to this, it is best for the patient to sit upright or walk gently about, and so assist the action of the uterus.

When the labor pains become very great, the patient should be placed on the bed, previously guarded by some waterproof material, on her left side, and not far from the edge, so that needful assistance can be easily rendered. She should have a tightly-rolled pillow placed between her knees. If there is no unnatural obstruction to the delivery, it is best left to nature. Should the patient in the struggle become very faint and weak, a little brandy and water may be administered at short intervals, but this must be stopped as soon as the labor is over, or inflammatory action may ensue.

In due time—it may be in two hours, or four, or six, or even, in the case of a first child, twenty-four hours—the infant is born, and treated according to the directions given in the management of infants.

As soon as the child is born, and the navel string has been cut and tied (see management of newborn, p. 495), a broad bandage or towel may be passed around the body of the mother, so as to cover the hips, drawn tightly, and pinned or tied, so as to sustain a pressure upon the womb, and stimulate the vessels to return to their normal condition. Before this is done, however, it will be best to grasp the uterus with the hand and with gentle pressure force the removal of the placenta, commonly called the afterbirth.

For a few hours after labor, the patient should be disturbed as little as may be. If the pulse is thin and feeble, and the cheeks colorless, put a very little brandy and water between her lips now and then; but stop instantly if it produces flushing or restlessness; and do not give it at all unless there seems urgent necessity for a stimulant. Soiled bedclothes and body linen may be changed as soon as the condition of the patient will permit; but all this should be done very carefully and gently to prevent fatigue. If the afterpains are severe an anodyne draught may be given. It may be composed of from twenty to thirty drops of tincture of opium, or one-eighth of a grain of morphine, in an ounce of water.

For eight or more days after labor, the recumbent position should be strictly maintained; and the same rule holds good after a miscarriage. Some women feel so well and strong in a day or two that they will sit up, and sometimes even get out of bed and make themselves useful in the house. We have seen a woman at the washtub three days after she had been confined; and we have heard of females undergoing the pains of labor under a hedge by the roadside, and in a few hours proceeding on their journey with their babes at their breasts. But these women were semi or entire barbarians; they had not been delicately nurtured. With the immense advantages, we must also take some of the disadvantages of civilization, and those who give birth to children surrounded by all its comforts and luxuries, must not attempt to emulate the Indian squaw. If they do, they will inevitably suffer for their temerity. Getting about too early after confinement is, perhaps, the most fruitful of all sources of uterine disease. Delicate women, especially, do wrong to attempt it, and the strong will be likely to render themselves weak by the practice.

THE BREAST.

We use this term in its restricted sense, as applied to the glands for the secretion of milk. Their full development depends greatly upon habit and constitution, being in some much more early prominent than in others. In pregnancy their fullest development commences: the breast swells, and the nipple enlarges, and by, or near, the time of delivery, it is filled with lacteal fluid. Too frequently the proper enlargement of the breast is retarded by tight lacing. The consequences are an insufficient supply of milk, or a failure of it altogether; or a nipple so flattened and pressed into the breast that it cannot be taken hold of by the mouth of the infant.

INFLAMMATION OF THE BREAST.

This is a common affection. Various causes may produce it, such as a blow, exposure to cold, etc., but the most common cause is infection through fissured nipples. When it occurs within the first week after delivery, the symptoms are caking of the breast, a lump forming here or there in the substance of one or both breasts. The breasts are painful and red. The patient experiences a chill or chilliness. There is fever, rapid pulse, thirst, and loss of appetite.

Treatment.—Preventive. The bowels should be moved daily, the breasts should be washed before and after nursing with a boric acid solution (one teaspoonful to a pint of water).

If fissures develop, a breast shield should be used and the fissures treated with compound tincture of benzoin applied with a camel's-hair brush to the fissure only. Or, they may be covered with subnitrate of bismuth and castor oil, equal parts.

Compression of the breasts by bandage, a brisk purgative, such as Epsom salts. On this treatment the condition frequently subsides within twenty-four or thirty-six hours. Should it persist, as it frequently does in those cases which commence during the third or fourth week after delivery, the symptoms already enumerated become more marked, and the caked portion of the breast becomes soft and fluctuating. Pain is constant and of a throbbing character. If suppuration takes place, we have to deal with abscess of the breast and treatment is surgical.

The child must not be allowed to nurse an inflamed breast. The milk may be withdrawn by means of a breast pump, the breast kept at rest by means of a tight fitting bandage. The breast may be smeared with ointment of belladonna applied once daily and stroked toward the nipple.

Or, lint kept wet with lead and opium wash may be applied.

Internally a brisk purge with Epsom salts repeated daily to lessen the formation of milk, and the following capsule to reduce fever and lessen inflammation:—

Quinine Sulphate,.....30 grains.
Powdered Opium,.....1½ grains.
Extract of Aconite Root,.....2 grains.

Mix; and divide into six capsules. Take one every three hours.

If suppuration takes place, the treatment is surgical.

SORE NIPPLES.

These frequently occur after childbirth. Nipple shields may be readily procured, and should be used when the nipples are too sore and tender to bear the application of the infant's mouth.

Equal parts of glycerine and tannin make a good application. It should be applied with a camel's-hair brush, first wiping the part dry with a soft piece of linen.

Or, each fissure may be treated twice daily with silver nitrate, twenty grains, dissolved in an ounce of water and applied by means of a camel's-hair brush (this causes the tissues to turn black).

These must be washed off before the child nurses.

MILK FEVER.

At the onset of lactation, the patient may suffer a slight feverishness.

Causes.—The cause may be a cold, or any obstruction to the flow of milk from the breast.

Symptoms.—Its first symptoms are increased heat of the system, preceded by shivering, and sometimes accompanied with vertigo and slight delirium. These are followed by severe headache, thirst, dry tongue, quick pulse, throbbing of the temples, and intolerance of light.

Treatment.—Spare diet, perfect tranquillity, cooling drinks, and saline medicines; the head should be kept somewhat elevated, and bathed with cold water or evaporating lotions. If the symptoms should become worse in spite of this, apply frequent cooling lotions to the head, and put the feet in a warm mustard bath. Most lying-in women have more or less of this fever, which is no doubt an effort of Nature to rouse the hitherto dormant mammary organs to secrete a proper quantity of milk.

THE LOCHIA.

This is a discharge from the uterus, which appears after the birth of the child and delivery of the afterbirth, and continues for from two to four weeks. For the first week it is blood color, thereafter the color gradually disappears until it becomes clear. The napkins applied should be perfectly sterile, and changed frequently during the first two or three days.

Should any putrid odor attach to the discharge, the physician should be notified at once, and hot water vaginal douches containing a small teaspoonful of creolin to the pint should be used three or four times daily. If, after the blood has disappeared from the discharge, it should reappear, as it frequently does when the woman gets up too soon, she should return to bed, use the hot vaginal douches already mentioned, and take twenty drops of tincture of chloride of iron, well diluted, three times daily. If the blood discharge is very free, fluid extract of ergot, thirty drops three times daily, may be taken to arrest the flow.

AFTERPAINS.

These seldom appear after the birth of the first child, but following subsequent labors, particularly if the womb has not been thoroughly emptied of afterbirth and blood clots, they are very severe.

Treatment.—Immediately after delivery of the child, fluid extract of ergot, one-half to one teaspoonful, should be administered to cause the uterus to contract and expel its remaining contents. For relief of pain, five grains of Dover's powder; or one-eighth grain morphia; or two teaspoonfuls of the camphorated tincture of opium (paregoric), may be given and repeated every four hours as necessary.

CONSTIPATION AFTER DELIVERY.

The bowels should be moved at the end of the second or third day by the use of Hunyadi water, Apenta water, Seidlitz powder, or a pill containing:—

Aloin,.....¼ grain.
Belladonna,.....⅛ grain.
Strychnia Sulphate,.....1-60 grain.
Ipecac .....1-16 grain.

RETENTION OF URINE.

The urine should be voided some seven or eight hours after delivery. If difficulty is experienced in passing urine the woman may rest on her hands and knees. Frequently this change of position will enable her to urinate freely. Hot applications over the bladder, or sprinkling cold water over the region of the bladder, are sometimes efficacious. If these do not suffice, the water must be drawn off through a surgically clean catheter.

DIET AFTER LABOR.

For the first twenty-four hours, tea, coffee, cocoa, milk, water, and toasted bread may be allowed; on the second and third days, the foregoing liquids, together with soups, beef tea, poached eggs, oysters raw or stewed. From the fourth to sixth days, the breast of chicken, baked potatoes, junket, wine jelly, malted milk, cereals, may be added to the diet already given.

On and after the sixth day the patient should gradually return to her regular diet, avoiding pork, cabbage, turnip, beans, and all fried and greasy foods. Her diet should be nutritious and easily digestible.

PUERPERAL MANIA OR NERVOUSNESS.

This disease frequently attacks women either a little before, during, or shortly after childbirth, and sometimes during nursing.

Symptoms.—Great nervous irritation; the face is commonly pallid, the eye troubled, the tongue white, and skin hot; the mind wanders and conduct is very irregular.

Treatment.—Give a purge of senna and salts, and keep the bowels regular by the compound rhubarb pill. Keep the room darkened and let the patient be kept quiet, and free from the interruption of friends.

Promote sleep by use of bromides (bromide of ammonium, bromide of soda, bromide of potash, of each ten grains), administered twice or thrice daily as required. If the patient refuses to swallow, suitable treatment will be injected hypodermically by the attending physician.

Or, bromide of ammonia, forty-five to sixty grains, together with chloral hydrate, fifteen to thirty grains, suspended in milk, may be injected into the rectum.

CHILDBED FEVER OR SEPTICÆMIA.

Causes.—The retention of the afterbirth, either in whole or in part, and the decomposition and absorption of it into the circulation. This decayed matter added to the blood brings about a condition of blood poisoning.

Symptoms.—It usually appears in from two to four days after confinement. It is almost invariably manifested by a severe chill, or at least by a sensation of cold. The temperature rises and may reach 105 degrees or 106 degrees, or even higher. The pulse rate follows the rise in temperature and reaches from 130 to 160 beats a minute. At the onset the face is flushed. The patient rarely complains of pain. There is very rarely delirium or unconsciousness in the early stages. The discharges from the vagina have a fetid odor, and usually diminish in quantity. Peritonitis may complicate the trouble, in which case there is pain in the abdomen, and the temperature does not run so high as in the simple cases of blood poisoning.

Prognosis.—This is one of the most serious complications of childbirth. Much depends upon prompt recognition of symptoms and immediate attention. The prognosis is always grave.

Treatment.—In all cases of confinement when there is the slightest appearance of a chill, immediately notify the physician in charge. The same is to be done when a fetid odor attends the discharge. If the antiseptic vaginal douche is not sufficient to prevent this sign of decomposition, that is evidence of retention of the placenta, or afterbirth, or part of it. This matter must be removed at once. There must be no blood clots or coagulated blood remaining in the uterus or vagina. A wash of two quarts of warm water to which either twenty or thirty drops of carbolic acid or from three to four drams of boric acid have been added must be used to flush out the parts. This is to be repeated once only in from three to four hours. After that, once a day is sufficient. No medicine will be of any use so long as any of the foreign matter remains in the organ. The bowels must move freely; good liquid or semi-liquid food is to be given; and such general symptomatic treatment as the developments of the case may call for.

THE HOUR OF ANXIETY

BOOK VI.

CARE, FEEDING, AND DISEASES OF CHILDREN.

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Care of the Newborn Child.—After the cord has been tied the child is to be placed in a warm blanket in a warm room, while the nurse gives attention to the mother. The eyes of the child are to be thoroughly cleansed with warm water, or, better, with a solution of boric acid of the strength of a teaspoonful of boric acid to one pint of warm water. This is best administered with a dropper or glass rod, and the eyes and eyelids afterwards wiped dry with a piece of lint. Before bathing, the child's body is to be well oiled or anointed with vaseline to soften the cheesy substance with which the body is covered. This substance is called the vernix caseosa. It is not absolutely necessary to remove all of this matter at the first washing, for that sometimes requires more violence than is good for the delicate skin of the child. It will come off of its own accord in a very short time. The first bath is then to be given in water of 100°. Great care is necessary in handling the child lest it fall by reason of the oily coating which it has received. After bathing, attention is given to the cord to see that it has not slipped during the bath. The mouth is cleansed with tepid water with great care, for the parts are very delicate and will not stand any roughness. The cord is to be covered with a dusting of powdered boric acid, or

Salicylic Acid,.....1 dram.
Powdered Starch,.....19 drams.

This is dusted over the stump of the cord. It is not well to use too strong an antiseptic dressing for the cord, as that will prevent the stump from falling off as soon as desired. The navel is then covered with a piece of lint or dry gauze or absorbent cotton. A strip of flannel of about eight or ten inches in width is then passed around the child's body loose enough to admit of the easy introduction of a finger under it. Before dressing completely it is well to look the child over in examination for any injuries received during delivery or for deformities, etc. As soon as it is dressed it is to be placed in its crib wrapped in warm blankets. Should there be any indication of poor circulation, cold feet, or the like, the child should have hot water bottles placed near to it in

the crib, but not touching it. The usual precautions about tightness of corks, and absence of danger of leakage are to be exercised.

First Suckling of the Child.—In a few hours after bathing the infant may be put to the breast. For the first two days the breasts yield a peculiar milk called the colostrum. It is very nourishing and mildly laxative. The child should partake of this every four hours.

The Meconium.—The fecal matter formed in the bowels of infants before birth is called meconium. Its timely removal is a matter of no small importance. Nature has furnished the appropriate purgative for this purpose in the colostrum. The small portion of fluid which the child usually receives at the breasts during the first two days possesses a decidedly purgative character and generally causes the entire evacuation of the bowels. Nothing can be more prejudicial to the child's health than the almost universal custom of administering some artificial purgative to bring about this effect. If the child is permitted to suckle before the proper milk is secreted adequate purgation will follow naturally in nine cases out of ten. When, however, the child's bowels do not move, give a pinch of brown sugar in a teaspoonful of water, or one-half teaspoonful of olive oil, or a small injection of soap and water. During the first two days of life the discharge from the infant's bowels is black; sometimes tinged with green; but on the third or fourth day, when the mother's breasts are secreting true milk, they change to yellow.

Urine.—If the infant does not void urine during the first twenty-four hours, sprinkle the region over the bladder with cold water, or give the infant a warm bath. If this does not suffice call the attention of the physician to the matter at once. It may be that no urine is secreted because the child has had too little nourishment, or there may be some deformity of the urinary tract.

DISEASES OF NEWBORN CHILDREN.

APPARENT DEATH OR ASPHYXIA.

A pulseless and lifeless appearance of the newborn child.

Causes.—Interference with the circulation of the blood before or during birth; pressure on the cord; or natural weakness and debility of the child.

Symptoms.—If there is only slight asphyxia the child is pale; anæmic; the limbs lifeless; and the heart beats feebly. If the asphyxia

is more severe and breathing has occurred prematurely, the face is purple; eyes, bloodshot; pulse, slow and full; and gasping breathing.

Prognosis.—If the heart action is audible, however faint, there is always hope; there is danger of pneumonia or of brain trouble if life is saved.

Treatment.—In most cases the child begins to breathe and cry as soon as it is ushered into the world. This, however, is not always the case. Many children manifest no signs of animation when born, who may, nevertheless, be re-animated by prompt and judicious management. When this state of apparent death depends on lack of oxygen, the infant's countenance exhibits a livid or deep red and bloated appearance; the eyes are prominent, and the surface of the body is warm and reddish. Sometimes the body is flaccid, and the navel string has ceased to pulsate. Everything depends on the speedy resuscitation of the child. When the cord pulsates vigorously, little effort is usually required for setting the vital functions again in operation. An effort may be necessary to excite the respiratory functions by artificial inflation of the lungs and compression of the thorax with the hands. In inflating the lungs a silk handkerchief folded double, or a fine napkin, should be laid over the mouth of the infant; the nurse should then apply her mouth to that of the babe, at the same time closing its nostrils, and endeavor by moderate but uniform force of insufflation to fill its lungs with air. The covering of the infant's mouth is recommended as a means of avoiding rupture of the pulmonary air cells.

Some infants remain for a minute or two after birth without any or with few efforts to breathe, although they will open their eyes and move their extremities with considerable vigor. A few drops of water sprinkled on the chest or abdomen will instantly cause them to breathe and to cry out lustily. The main point of caution in cases of this kind is to avoid tying the cord until its pulsation has ceased or has become quite feeble. In all cases where respiration does not ensue immediately after birth, or is in any degree embarrassed, prompt attention must be given to the removal of the mucus which is usually lodged in the mouth and larynx of newborn infants. A swab of absorbent cotton should be carefully introduced into the mouth, and the tenacious slime brought away.

Infants are sometimes born in a state of asphyxia. If in such cases the cord pulsates it must on no account be divided until pulsation has ceased. The mouth should be immediately cleared in the manner

just indicated, and a little cold spirits, or cold water, be dashed on the pit of the stomach. So long as the cord beats, some stimulant such as brandy, spirits of camphor, or ether, may be applied to the lips and nostrils. It is also proper to rub the body and extremities gently with dry, warm flannels. When the pulsation of the cord has ceased, and the child still continues in this state, the cord must be divided and the infant wrapped in dry and heated flannel, which is better than the warm bath. It is not well to hastily abandon infants in this condition; thirty minutes and even a longer period may elapse before the child begins to breathe.

In all cases where resuscitation has been effected from a state of asphyxia, it is of the utmost importance to permit the infant to lie perfectly at rest for several hours, before it is subjected to the agitation and fatigue of washing and dressing. Infants born between the seventh and eighth month generally remain in a somnolent condition for several weeks, and ought to be as little disturbed by washing and dressing as possible.

Occasionally feeble infants suddenly sink into a condition of syncope, or apparent death, after everything seems to be going on well. This death-like condition usually continues for a few minutes and then gradually passes off leaving the infant in a languid and fretful state. This affection is probably the result of some intestinal irritation. During the paroxysm efforts must be made to re-excite the vital power by wrapping the child's body in a piece of thick flannel wrung out of hot whisky. A drop of ether, or of spirits of camphor, should be applied to the nostrils and lips and weak mustard plasters may be laid on the soles of the feet.

JAUNDICE OF NEWBORN INFANTS.

A yellow discoloration of the skin which appears within three or four days after birth.

Causes.—Frequently it is the result of too tight application of the band around the abdomen.

Prognosis.—Generally good.

Treatment.—The mere loosening of the band has often been sufficient to relieve the condition. Should the condition not then subside, one-fourth grain of calomel with a grain or two of white sugar or of sugar of milk may be given twice daily for a day or two. If free purging does not follow, this condition must be relieved by the use of castor

oil. The daily use of the warm bath and gentle friction with the bare hand over the region of the liver and stomach will be beneficial, provided there is no tenderness of the region or any inflammation.

INFLAMMATION OF THE BREASTS OF INFANTS.

An inflammation of the glands of the breasts of children of either sex.

Causes.—There is a common superstition among nurses that the secretion of a few drops of milk in the breasts of newborn infants, both male and female, is to be squeezed out for good luck. Others call it "witches' milk." Efforts to press this milk out causes a rupture of the delicate glands and consequent inflammation.

Symptoms.—The breasts become red, swollen, and tender. If it does not pass away almost at once an abscess forms with the secretion of pus.

Prognosis.—Generally good; but erysipelas often results as a complication, and this is usually fatal.

Treatment.—Usually this does not require treatment; but, if an abscess forms, the attention of a doctor will be required.

ERYSIPELAS OF NEWBORN INFANTS.

An infectious disease that attacks newborn infants and in no way differs from the erysipelas of adults. Also called St. Anthony's Fire and The Rose.

Causes.—The infectious micro-organism which causes the disease to appear from two to seven days after birth, circumcision, or injury in which the skin is broken.

Symptoms.—There is high fever; rapid pulse; sometimes convulsions and diarrhœa. The disease begins generally on the lower parts of the body as a small, red blotch, and gradually spreads over the abdomen and thighs, presenting a swollen, dark red surface. In most cases, soon after inflammation is established, vesicles make their appearance, and the disease soon assumes a dangerous condition, the danger of suppuration and gangrene being very great.

Prognosis.—The earlier the age the less favorable the prognosis. Very fatal in infants younger than three weeks.

Treatment.—The air is to be excluded by local applications of cornstarch, cotton wool, collodion, or a five per cent solution of ichthyol, or a mixture of ichthyol and vaseline in equal parts. Holt recommends a ten to twenty-five per cent ointment of ichthyol spread

upon muslin, applied daily, and covered with gutta-percha tissue to prevent drying. Good nursing, nutritious food, and stimulants to keep up the pulse are also required.

LOCKJAW OF THE NEWBORN OR TETANUS.

An acute, infectious disease marked by paroxysms or spasms.

Causes.—It is caused by the micro-organism known as the tetanus bacillus. This infectious organism usually gains entrance through the wound about the navel.

Symptoms.—Usually the first sign of the disease appears between the fifth and tenth days, in the form of stiffness of the jaw and attendant difficulty in nursing. The child first relaxes and then stiffens and remains rigid for a minute or two. This rigidity increases and affects the entire body. The body becomes wooden in its stiffness. The pulse, breathing, and temperature rise very high.

Prognosis.—The outlook is very bad. Fatal cases seldom last more than forty-eight hours and often only twenty-four.

Treatment.—This consists chiefly in the use of narcotics and anæsthetics to control the spasms. The tetanus antitoxin has proven beneficial where it could be given in time. The child must be kept quiet without unnecessary moving, bathing, etc. Feeding is best conducted through the nasal tube.

SORE EYES OR OPHTHALMIA OF THE NEWBORN.

A highly infectious disease of the eyes in newborn children.

Causes.—A micro-organism contained in some secretion of the mother which comes in contact with the infant's eyes during labor. Where the child opens its eyes prematurely this danger of infection is increased.

Symptoms.—There is a warning symptom which takes the form of a red line drawn around the lids as though done with red ink. If this is neglected the disease passes on to the second stage, during which the eyelids swell, a thick, purulent matter begins to issue from the eyes; the child becomes fretful and uneasy and keeps the eyes persistently closed. In the third stage the swelling of the lids increases, and ulceration of the cornea results.

Prognosis.—Good so long as the cornea is not involved and abscess and perforation do not result. This is the most fruitful cause of blindness of children. Nearly one-third of all cases of blindness of

children result from this disease. With good nursing and early attention the prognosis is favorable.

Treatment.—The child should be isolated and the doctor called at once. If neglected in its early stages, the eye may be permanently injured and the sight destroyed. Constant attention must be given to washing out the eye with an antiseptic solution. It does not so much matter which is chosen so long as the application is made often. The following is a good one to use:—

Boric Acid,.....1 heaping teaspoonful.
Hot Water,.....1 pint.

In applying this use a dropper and inject the solution into both sides of the eye and see that the application is made to the entire surface of the eye, every twenty minutes, night and day. Once or twice a day the eyes are to be treated with a few drops of a fifteen to twenty-five per cent solution of argyrol. The next most helpful application is cold compresses applied every few minutes by keeping fresh compresses on blocks of ice. If only one eye is affected the unaffected eye is to be kept covered with an antiseptic applied to a cloth, to prevent infection. These cloths may be kept in place over the well eye by strips of adhesive plaster. The greatest cleanliness is to be observed and cloths are to be destroyed after use in any way about the patient. There is also very great danger of the nurse becoming infected unless the strictest antiseptic precautions are observed.

INFLAMMATION OF THE NAVEL OR OMPHALITIS.

Causes.—This condition may be brought about either by bandaging too tightly, or may be the result of infection. The tying of the cord leaves a wound which is a favorable place for the entrance of germs of disease. This condition is aggravated by uncleanliness, the result of which is really a sort of blood poisoning.

Symptoms.—Usually during the second or third week of the infant's life there may be noticed redness, swelling, and hardness around the navel. This will result in disappearance, abscesses, or gangrene according to the promptness and efficacy of treatment or the lack of these precautions. Usually the condition terminates in a number of small abscesses which may be only on the surface of the wall of the abdomen or may be more deeply seated. There may be sloughing of the parts, or an eruption similar to that of erysipelas, or gangrene of the parts may result.

Prognosis.—This is favorable if treated in time. There is danger of the inflammation extending to the peritoneum causing peritonitis and the danger is then very greatly increased.

Treatment.—As soon as inflammation of the part is detected, the utmost cleanliness must be observed. Wash the parts thoroughly but not roughly with a solution of boric acid of the strength of one teaspoonful of boric acid to a pint of water. Then dress the parts with aristol, or with equal parts of the nitrate of bismuth and iodoform. If there is an appearance of granulations, which are the little grain-like growths which attend ulceration, the parts should be touched carefully with a solution of:—

Nitrate of Silver,.....10 grains.
Water,.....1 ounce.

The inflammation of the parts surrounding the navel, which sometimes occurs and resembles the eruption of erysipelas, may be kept in check by the use of cloths dipped in the boric acid solution. If gangrene forms it may be removed by the application of the peroxide of hydrogen.

The inflammation of the veins and arteries of the navel is a serious complication or, really, extension of the inflammation. The prognosis in such cases is very bad.

RUPTURE OF THE NAVEL OR UMBILICAL HERNIA.

Causes.—This results from the imperfect healing of the wound at the navel, and the formation of an opening large enough to permit of the protrusion of a part of the bowel. Where this opening does not heal well, or when there is a weakness of the wall of the abdomen, such conditions as the formation and accumulation of gas in the intestines, accumulations of masses of fecal matter, continuous crying may produce force or pressure enough to cause the bowel to protrude.

Prognosis.—The majority of cases yield to simple treatment; others persist until adult life; but there is always the possibility of peritonitis resulting from the strangulation of the bowel.

Treatment.—Mechanical pressure to keep the bowel in place and to close up the opening artificially is the simplest treatment. For this purpose a piece of flat cork larger than the opening of the navel is laid over the opening after the hernia has been reduced. This cork is kept in place by a bandage, or better by strips of adhesive plaster around the waist.

CARE OF PREMATURELY BORN AND DELICATE CHILDREN.

Premature birth is that which occurs before the full term has expired. Delicate children at birth are those which give evidence of congenital weakness or of imperfect development.

Among the indications of such conditions are a weight of less than four pounds at birth; a length of less than nineteen inches; delicate and almost transparent skin; weak cry; breathing weak and irregular; very slight and weak movement of the extremities; inability to suckle by reason of weakness of the muscles of the mouth; difficulty in swallowing; and limp condition of the body.

The treatment of such children aims at securing a proper degree of bodily heat, and the taking of sufficient, proper nourishment. One method of keeping up the temperature of the body, advocated by Dr. Holt, is to oil the body and wrap the child in cotton batting from head to foot, leaving only the face exposed.

The child is then placed in a crib, well sheltered from all drafts, and well covered. Hot water bottles are placed about the child, and the bodily temperature taken at frequent intervals to see that it is not raised too high or does not fall too low. Instead of the hot water bags, electric heaters may be placed under the blanket upon which the child rests. These are especially made for communicating warmth, and are attached to an ordinary electric light holder. The wrapping of cotton batting is changed every three days, and the child is fed in bed without removal. A pad of gauze or absorbent cotton takes the place of the ordinary napkin.

The other method of maintaining the requisite degree of bodily heat is by means of the incubator. This is practically a box with glass

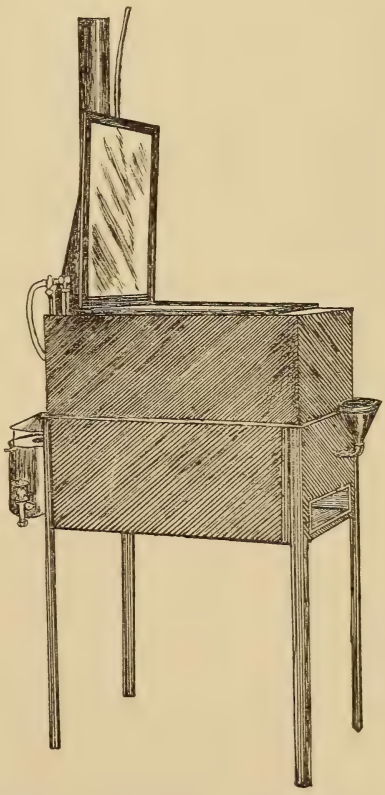

FIG. 62. INCUBATOR FOR CARE OF PREMATURELY BORN AND DELICATE INFANTS.

doors; and so arranged that it can be both heated and ventilated. To do both of these highly necessary things, one person's time must be devoted to watching the child and the incubator. Variations of temperature are very serious, as are also periods of imperfect ventilation. The difficulty of feeding a child without reducing the temperature is not the least of the difficulties. So intricate is the proper management that only skilled attendants can bring good results, and altogether it can hardly be considered practical outside of an institution.

The feeding of such children is regulated entirely by the size and strength of each particular child. Some are able to nurse in a day or two; others can be fed with a medicine dropper or similar instrument; but a very great many must be fed by force, or by gavage, as that is called. This is done with a small funnel and a tube such as a catheter, which is put down the child's throat and the food very slowly and carefully given to guard against the food returning, or against strangulation. During the first day such children as are unable to nurse are given only water at the rate of a teaspoonful or two every hour. For children of very low weight and imperfect development the only good results are obtained from the use of mother's milk. If the mother cannot supply this a wet nurse must be procured. Of such milk half an ounce is given every hour. At the end of two weeks this amount is to be increased to an ounce and the interval lengthened to an hour and a half. In three or four weeks the amount is again increased to an ounce and a half and the interval lengthened to two hours. In the case of a larger and stronger child it is possible that artificial food may be taken; modified milk as given on page 522 may be used as there recommended.

In all cases immediate attention must be given to the child.

THE NURSERY.

This is the room in which the child spends most of his time while indoors. In the very great majority of homes it is the living room of the family and not a room set apart for the child and its nurse or mother. Whatever hygienic or unhygienic conditions prevail in the home generally will be met in that room. If they are good, the child has a fair start in life; if they are bad, the child of that household is terribly handicapped and is not being fairly dealt with. If these conditions are not right, the burden of making them so ought not to fall upon the mother and housekeeper. It is true that she is the one

who spends most of the time in the house and knows these conditions better than the father whose business calls him outside all day. But there should be united effort to change all that needs change and to see that the child receives those healthful surroundings which mean very much more to him than the accumulation of a bank account which he may never live to enjoy. Beyond all doubt no parent is doing right who allows his child to live in rooms which the sunshine does not reach during several hours a day, which are not dry, and in which there is not an abundance of good, fresh air all of the time.

The temperature of the room should not rise above 70° F. The best temperature is 65° F., if that can be uniformly kept; but that is ordinarily impossible. Therefore it is better to have it a few degrees higher for safety. The only sure guide to the proper adjustment of heat is the thermometer, which should be in every home. But look out for draughts near the floor. Very often the upper parts of the room may be of a comfortable temperature while the air on the floor is several degrees lower. To be sure that this is not the case the temperature must be taken on the floor as well as at the height at which a thermometer usually hangs in a room.

The furnishings of the room should be as healthful as possible. Rugs are better than carpets for the floors. The chairs should be plain wood rather than upholstered; the hangings of the windows should be simple dark shades that the room may be darkened during the day nap; dirt-catching curtains should be removed. The windows should be provided with bars for the protection of older children against the risk of falling out. The bedstead should be of enameled iron; the mattress and pillows of hair, protected by a rubber sheet; and there should be no bedclothes or bed hangings that cannot be easily and fully washed.

There should be no plumbing in the room nor should it communicate directly with the bath room. Napkins and soiled clothing must not be dried in the room. The burning of gas as a night light produces more foul air than the breathing of two or three persons. The best nursery light is a wax candle. Kerosene lights, if properly adjusted, will not give off much odor, but it is difficult to adjust them.

The air in the nursery should be thoroughly and completely changed twice a day. This is best done in the morning after the child has been bathed and again towards evening. During this change of air the child should be removed to another room. It is also convenient to air the room while the child is out of the house.

Sleep.—During the first few days of life a child sleeps a great deal. This sleep may be so profound as to cause alarm, but if it is not attended by convulsions or rigidity of the muscles there need be no concern. If a child is healthy, free from pain, discomfort, or hunger, it will sleep during the first four or five weeks from twenty to twenty-two hours out of the twenty-four. Towards the latter part of the first six months, it sleeps from sixteen to eighteen hours a day, its waking intervals being from half an hour to two hours. By the end of the first year the sleeping time has been reduced to fourteen hours a day, usually made up of eleven or twelve hours at night and two naps of from an hour and a half to two hours during the day. At two years of age it sleeps about thirteen hours a day including one nap of from one to two hours in the day. After the third year the heavy sleep of childhood begins and the child gets from eleven to twelve hours a day. After the third year the nap during the day is often skipped occasionally and is secured with more and more effort.

Much discomfort will be spared both mother and child if right methods of sleeping are taught at the start. After the child has been fed it should be placed in its crib in a darkened room and allowed to go to sleep without rocking, or other incentive. It should never be allowed to go to sleep with the nipple in its mouth or with so called pacifiers. The use of all such artificial means only encourages the use or desire for them and the consequent formation of bad habits. Of course the child may cry at first while this education is going on; but the mother must remember that the child is not crying from pain or from suffering, but if left alone will soon go to sleep of its own accord. During the day the child should be wakened from sleep every two hours or two hours and a half to be fed. At night it should be allowed to sleep for six or seven hours without feeding. This method secures not only regularity of feeding but also correct habits of sleeping.

Airing.—In fine summer weather the infant may be taken out for an airing at the end of the first week. In colder weather this must not be done until the child is a month old, and then only when the temperature is over 60° F. The first outing should not exceed fifteen or twenty minutes. Each day thereafter the time is to be gradually lengthened until the outing lasts from two hours to two and a half hours. There must be proper protection of the head against winds, and of the eyes against the direct sunlight. It is a good plan to dress the child as though ready for outdoors, and then to open the windows

of the room on a bright day as a preliminary to going out. A child of four or five months may take an outing in winter on fine days when the thermometer stands above 20°. But when the wind is high, or the snow is melting, or during storms, a child should not go out. But on all fit occasions a child should be out of doors as much as possible, even sleeping outdoors in preference to indoors in the daytime.

Exercise.—The first exercise the child gets is through crying. No concern need be felt if a child cries for a total of twenty or thirty minutes a day. This develops the lungs, and, in fact, does much towards the development of the muscles. Then comes the kicking and play of the limbs while lying in bed or on the mother's lap. This and the resistance against the hand placed at the feet are genuine forms of exercise. To facilitate this there should always be free play to the child's limbs. It is wrong to so clothe the child that these movements are impeded. Carrying the child about, frequently changing its position, and rubbing its back and limbs are also beneficial forms of exercise. This applies to children who are too young to creep or stand. When that activity begins the child should have every possible means of indulging it. A mattress or thick rug should be placed on the floor upon which the child may roll or kick at will. Later in life the child will begin those helpful and beneficial forms of games which will supply all that is needed.

Clothing.—There are only a few fundamental principles to be observed in the clothing of children. The clothing must not be tight-fitting. The free play of the limbs must not be interfered with, nor must the binder be so tight as to compress the abdomen or chest. The latter must always be so loose as to easily permit the finger to be inserted between it and the body. Next, all parts of the body covered by the clothing must be as uniformly protected as possible. The only exception to this may be in protecting parts of the trunk rather more than the extremities. But there is no possible justification for bare legs in cold weather. The clothing must be of such material as to keep in the warmth of the body in cold weather and to keep out the heat of the sun in warm weather. It must also be comfortable and agreeable to the skin. The objection to all-wool is its great liability to shrink. This is overcome to some extent by the use of merino, or a fleece-lined cotton. Next to the body of children of all ages should come the woolen shirt, which should be both high in the neck and full length in the sleeves. The band is worn under this by young infants for the first month; after that it is of rather doubtful value. If the child

is thin and delicate so that the walls of the abdomen are not so strong as is desired, it may be continued, but must never be drawn tight, in spite of its name. In summer the shirt is to be of fine flannel, very thin, or of gauze. The napkins, or diapers, are to be of absorbent material, preferably stockinet or Canton flannel. Under no conditions should rubber or waterproof material be used for this purpose. The feet must be kept warm, if necessary a hot water bottle is to be used in the bed at night. Cold is too frequently the cause of colic and of indigestion. The night clothing of the child must be warm, but not burdensome. Where children will not keep the covers over them at night, a garment with feet may be used of a weight adapted to the season of the year. Where children have too much night clothing they are usually restless.

Bathing.—For the first six months the temperature of the bath should be at the normal temperature of the body,—about 98°. The room should be warm and the duration of the bath not more than ten minutes. There should not be very vigorous rubbing at this age. The soap should be of the best quality of castile and it is to be used very sparingly at first. After six months the temperature may be reduced to 95°; and at the end of the first year to 90°. At an older stage the bath may be concluded with a cold sponge followed by vigorous rubbing. But many children do not react from the cold bath and show the effects by dark rings around the eyes, and a shadow around the mouth. When these signs appear the cold bath must be discontinued. The best time to give the warm bath is in the evening, and the cold sponge in the morning. There is no risk in fine weather of a child going out in an hour or so after the warm bath, and at once after a cold sponge bath.

Growth and Development.—Observation of growth and development is necessary to ascertain whether or not the child is advancing properly, whether or not the food that he is getting is properly nourishing, and whether he is in a state of health. One of the easiest ways to judge of his development is by

Weight.—An infant should be weighed regularly during the first two years of life. This should be done in the case of healthy children every two weeks; in the case of delicate children more frequently. Scales especially designed for this purpose are fitted with a basket in which the child can be conveniently placed to be weighed. Care should be taken that the child is weighed at about the same time after feeding and stool on each occasion, as these considerations materially affect the weight.

The average weight at birth is about seven and one-third pounds. During the first two or three days after birth there is a loss of from one-half to one pound. This is partly due to the removal of matter from the intestines and the fact that the mother's milk contains no nourishment for the first two or three days. At the end of the tenth day the child has regained the lost weight and is again at the weight at birth. The weekly weighings of the child should be registered upon a weight chart. This will show the gain or loss, and is of immense value in cases of artificial feeding and in regulating diet for delicate children. If the lost weight of the first three days is not made up during the next succeeding week, there is every indication that the mother's milk is not nourishing and that artificial feeding must be resorted to. Where children are fed naturally there is a steady gain in weight after the tenth day. But if a child is fed artificially at that period there is usually a stationary period of about two weeks during which the child is adapting himself to the new conditions. After that the gain is steady if the food is agreeing with him. The child gains most during the first three months of his first year. From the six to the ninth month it is least. A child of average weight at birth ought to weigh three times that weight at the end of the first year, that is, about twenty pounds. He gains about a quarter of a pound a week during the first six months and a little less each week during the last six. If a child does not gain steadily, not necessarily in just such proportions, there is something wrong, and the conditions should be carefully investigated. The increase in weight during the second year is about six pounds; and in the third year between four and five pounds.

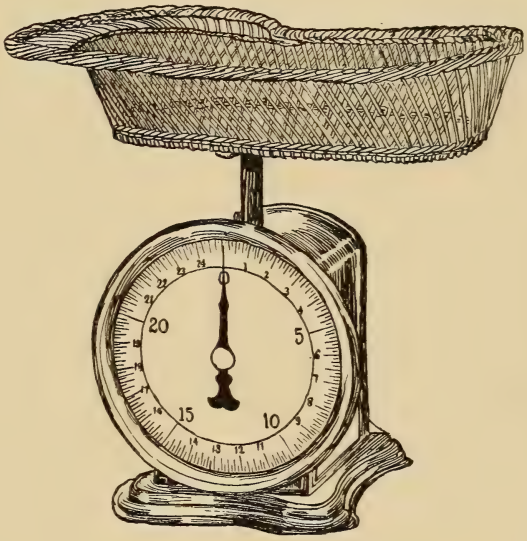

FIG. 63. SCALES FOR WEIGHING A CHILD REGULARLY.

Height.—The average height at birth is about twenty and one-half inches. During the first year a child gains a little over eight inches;

TABLE

SHOWING GROWTH AND DEVELOPMENT IN BOYS AND GIRLS FROM BIRTH TO TEN YEARS.

AGE	SEX	WEIGHT	HEIGHT	CHEST	HEAD
		Pounds	Inches	Inches	Inches
Birth	Boys	7.55	20.6	13.4	13.9
	Girls	7.16	20.5	13.0	13.5
6 mos.	Boys	16.0	25.4	16.5	17.0
	Girls	15.5	25.0	16.1	16.6
12 mos.	Boys	20.5	29.0	18.0	18.0
	Girls	19.8	28.7	17.4	17.6
18 mos.	Boys	22.8	30.0	18.5	18.5
	Girls	22.0	29.7	18.0	18.0
2 years	Boys	26.5	32.5	19.0	18.9
	Girls	25.5	32.5	18.5	18.6
3 years	Boys	31.2	35.0	20.1	19.3
	Girls	30.0	35.0	19.8	19.0
4 years	Boys	35.0	38.0	20.7	19.7
	Girls	34.0	38.0	20.5	19.5
5 years	Boys	41.2	41.7	21.5	20.5
	Girls	39.8	41.4	21.0	20.2
6 years	Boys	45.1	44.1	23.2	
	Girls	43.8	43.6	22.8	
7 years	Boys	49.5	46.2	23.7	
	Girls	48.0	45.9	23.3	
8 years	Boys	54.5	48.2	24.4	
	Girls	52.9	48.0	23.8	
9 years	Boys	60.0	50.1	25.1	
	Girls	57.5	49.6	24.5	
10 years	Boys	66.6	52.2	25.8	21.0
	Girls	64.1	51.8	24.7	20.7

in the second year, about three and one-half inches. Thereafter it is between two and three inches a year up to the eleventh year.

Development of the Muscles.—About the fourth month a child begins intelligently to grasp articles within his reach. About the seventh month he is able to sit upright for a short space of time. At ten or eleven he stands with slight assistance; and walks with ease in the fourteenth month. While all of these acts are performed by some children at an earlier age than that indicated it must be remembered that there are many children who do not perform these acts until a later period. Some children walk well as early as ten months; there are other who do not until seventeen months. Under no conditions should a child be urged or encouraged to walk. He will do this of his own accord as soon as his legs are strong enough to bear his weight. Apparatus for bearing his weight before the proper time to walk is certainly injurious.

Development of Sight.—Practically all that a newborn child recognizes by his eyes is the annoyance of light, which is shown by closing the eyes against it. A little later he learns to distinguish a light and to follow it with his eyes. It is probable that sight, as we understand it, does not come to him for some months.

Development of Hearing.—The newborn child is deaf. It is rare that any good evidence of the existence of this sense is seen before the third month.

Development of Taste and Smell.—It is probable that these two senses are present at birth, as indicated by the action of very young infants when placed at the breast.

Development of Speech.—The first indication of laughing aloud appears about the third or fourth month. A child can say single words at about one year, and is fairly well able to make simple sentences at two years. There are instances of children, mentally quite bright, who make no attempt whatever to speak at two years of age. In such cases, however, there is great reason to suspect that the child is a deaf-mute or is mentally deficient, and he should be tested accordingly

FEEDING OF CHILDREN.

Breast Feeding.—There is no substance in nature, nor can there be anything prepared by art, which forms so congenial and so wholesome a nourishment to the young babe as its mother's milk. It is almost superfluous to remark that nature manifestly intended this fluid as the child's

sole nutriment during the early days of life and until the primary teeth appear.

Mothers Who Should Not Nurse.—In many cases there is no milk secreted in the mother's breasts. There is another class in which the milk is not of good quality, which condition, unless the fact has been demonstrated in the attempted feeding of previous children, can be learned only after the effort has been made and the child's gain in weight carefully noted. Mothers who are in delicate health will not be likely to supply milk either in sufficient quantity or of a satisfactory quality to nourish the child well. Those who suffer from very severe and pronounced nervousness are very likely to supply a milk which will affect the child, if in no greater degree, at least with frequent colic. It is not right for a mother who has suffered severely from attendant diseases or conditions during childbirth to attempt to suckle her child. This refers more particularly to puerperal convulsions, blood poisoning, hemorrhages, and similar conditions. Mothers suffering from tuberculosis in any degree should also not attempt breast feeding. Not only is the supply usually both insufficient in quantity and lacking in quality, but the drain upon the mother's strength will only hasten the progress of her disease, to say nothing of the danger of infecting the child. The only recourse in all of such cases is either the wet nurse or artificial feeding.

The Wet Nurse.—In theory the wet nurse is the best substitute for mother's milk. But in practice the results are not what might be expected. One of the first difficulties which confronts us is the difficulty of procuring one that is satisfactory. The class of women who are most easily procurable are unfit by reason of bad habits, bad character, or bad health. The matter of expense is also to be considered. There was a time when the assistance of a wet nurse was considered the only solution of the difficulty of feeding the child when the mother was unable to do so. But that was at a time when the science of artificial feeding was practically unknown in comparison with the high degree of efficiency to which it has now attained. So that in the very great majority of cases, recourse may be had to the use of modified cow's milk when the mother's milk cannot be used. Still there are many cases when the services of a wet nurse are indispensable. Infants prematurely born, those who are extremely delicate, and those troubled with serious intestinal and gastric dyspepsia are often wholly dependent upon her for their lives.

Mixed Feeding.—A condition often exists where the mother's milk is of excellent quality and deficient only in quantity. There is no reason why the mother's supply should not be used as far as it will go and then

supplement it with artificial feeding. Such an arrangement is beneficial to the child, and when the proper time comes it lessens the difficulties of weaning the child. It is not well to combine the two methods at the same meal, chiefly because the child is getting two sorts of nourishment at the one meal, and it is difficult to tell what quantity of food the child is getting.

Care of the Breasts During Nursing.—After each feeding the nipples and breasts must be carefully washed, either with plain water or with a solution of boric acid of the strength of one ounce to the pint. Unless this is done with care the milk which runs into the wrinkles and small fissures will cause one of the forms of sore nipples which are so hard to cure. Ordinary cleanliness is not sufficient, but the most scrupulous attention must be regularly given to this matter.

Training the Child to Nurse.—It will contribute much to the mother's immediate welfare and her future comfort if she adopts right methods of nursing at the start. During the day the child should be wakened to take its feedings according to the table given in the next paragraph. At night this is not necessary, as the child will have been well nourished during the day, and it and the mother will have all of the great benefit of a good night's rest. Not only is the mother's strength conserved by this means but a better milk supply for the following day is insured.

Time for Feeding During the First Year.—On the first day the child has four feedings in the twenty-four hours; the interval is six hours; and the child has one night feeding. These feedings are not so much for nourishment as for the laxative effects of the first milk, the colostrum.

On the second day the child has six feedings in the twenty-four hours; the intervals are four hours; and there is one night feeding. From the third day to the end of the first month the child has ten feedings a day; the intervals are two hours from the time of beginning one feeding until it begins the next feeding; and there are two feedings during the night.

During the second month there are eight feedings during the twenty-four hours; the intervals are two and a half hours; and there is only one feeding at night.

During the third and fourth months there are seven feedings during the twenty-four hours; the intervals are three hours; and there is one feeding at night.

During the rest of the first year, beginning with the fifth month,

there are six feedings in the twenty-four hours; the intervals are three hours during the day and there is no night feeding. The day is considered to begin at seven in the morning and to last until nine at night.

It is to be learned with positive certainty by frequent weighing whether or not the child is thriving on the breast milk. If it does not, either artificial feeding or mixed feeding must be adopted according to circumstances. No time should be lost in making the change just as soon as the indications show that the child is not being properly nourished. It is much better for the child to have artificial feeding before the digestion has been impaired by improper nursing for some weeks or longer.

Weaning.—The proper time for weaning a child is to some extent determined by the progress it is making while being breast fed. If at any time the weight of the child becomes stationary, it is better to start supplemental feeding at once. If the child is losing weight it is absolutely necessary to wean it. Under ordinary circumstances, when the child is making satisfactory progress, it is begun at the end of nine months. There are some mothers who are able to nurse the child well until the end of the year, but this is rather unusual. Some, indeed, are unable to do so beyond the sixth month. This of course determines the time. It is better to choose a time when the child is well and a season that is good. Ordinarily the summer months are not the ones usually chosen because of the prevalence of gastric disorders at that time. But very often there is no room for choice in the matter; the welfare of the child demands a change of food at that particular time and there is greater probability of harm resulting from a continuance of the breast feeding than from the change to supplemental food. Where the case will permit the process is a gradual one. If the mother is supplying a large flow of milk there is danger of much harm and inconvenience resulting to her from a sudden stopping of the feeding. This condition is not always relieved by the use of the breast pump. The mother knows something of the conditions she will have to face in this process of weaning by her experience when the night meal was stopped some time previously. The process will be greatly facilitated if the mother has reliable assistance from some one who can give the child the feeding in place of the breast. So long as the mother is near the child there will be appeals that she will not be able to resist, and the unwisdom of yielding at this time only increases the difficulty for the future. The food that is chosen is some formula of modified

milk as given on page 522. It may be that she will be obliged to select a formula for an earlier age than that of her child, for one who has been for some months on a modified milk diet may be able to digest a larger proportion of milk than one who has been on breast milk. It is desirable that about the usual quantity of milk be given. If this is not known it will do to start with a gill and increase it at the next feeding if necessary. The same hours of feeding as formerly must be carefully observed, and the mother must make up her mind not to yield.

Very often conditions arise which make it imperative that the child be weaned suddenly. Such are discovery that the mother is again pregnant, development of an infectious or malignant disease, or inflammation of the breasts, and the like. Pregnancy in the mother does not affect the milk to a degree sufficient to produce marked instant results upon the child, but the quality of the milk deteriorates and the drain upon the mother is more than she can well stand. The effect of menstruation upon the quality of the milk is, in the opinion of the majority of authorities, very slight. The greatest change in the milk is noted in cases where the menstruation occurs rather late in the child's first year. The return of that function is to be considered a hint on the part of Nature that weaning would be better begun. If menstruation occurs early in the year the child need not be taken from the breast for more than a day or two, if at all.

In gradual weaning the child may have one of the formulas for modified milk feedings once a day; after a week or so two such feedings a day, and so on, until the breast milk is completely replaced by the cow's milk.

Sterilizing Milk.—Sterilization of milk in the true sense of the word means subjecting the milk to such a degree of temperature and for so long a time that all of the bacteria and all of their spores are destroyed. Practically it is not possible to do this except by boiling the milk for an hour or two on three or four successive days. Manifestly this is neither possible nor desirable for feeding purposes. For boiled milk is a very different food article from raw milk. Just what the exact chemical changes are that boiling brings about in milk is not definitely known. But there is a decided change in taste, and it is not desirable that milk be kept for so long a time as this process requires. It is found that the use of hot water or, better, the practice of boiling all of the utensils just before they are required for use, and the adoption of a lower temperature for a shorter time destroy nearly all of the bacteria and render the spores harmless for a time. This process is known as Pasteurization.

Pasteurization of Milk.—There are several sorts of apparatus more or less intricate, and nearly all effective for that purpose. They are in use in some of the larger dairies and milk laboratories of the country. But ordinary milk passes through so many hands that there is little certainty that germs of infection are not present. For home pasteurization it is only necessary to subject the bottles of milk to the effect of steam in a closed vessel for twenty-five or thirty minutes and to cool them rapidly at once. There should be provided as many bottles as there will be feedings during the day. These bottles should be of good annealed glass and not easily liable to break at the varying temperatures employed. The milk, cream, and water are mixed together and enough put in each bottle for a feeding. The limewater is not to be added until after the pasteurizing process, or the addition may be postponed until the bottle is needed for use. The bottles are then loosely plugged with absorbent cotton, and are placed in the steamer, or if that is not at hand the bottles may be placed in water the temperature of which is to be maintained at from 150° to 155° for twenty-five or thirty minutes. The bottles are then tightly corked with the absorbent cotton plugs, and placed for a little while in cold water and then laid on the ice, where they are to be kept until required for use. It is well to provide an extra bottle in case of accidents, breakage, or spilling. If only a portion of a bottle has been consumed at a feeding the remainder must not be used for a future feeding, but be thrown out. This process should be followed out in the preparation of modified milk. Absolute cleanliness of utensils is imperative, else the care and trouble taken in the treatment of the milk will be wasted.

Peptonizing Milk.—In cases of weak digestion it is often desirable to predigest the milk either partially or wholly. This is done by complete or partial peptonizing.

To partially peptonize milk, place one pint of fresh milk and four ounces of water in a bottle; add five grains of the extract of pancreas and fifteen grains of the bicarbonate of soda; and place the bottle in a pan of water at a temperature of from 105° to 115°, or at just such a heat as the hand can comfortably bear. It is to remain there from six to twenty minutes. At the end of ten minutes the milk will begin to assume a bitter taste, due to the process of digestion which has been started. This bitterness increases in proportion to the length of time the heat is continued. The number of minutes the milk is to be treated depends upon experiment. When the process has continued

long enough, the peptonizing must be stopped, not merely by taking it out of the water, but by subjecting it to cold at once. If the milk is to be used at once this is not necessary; if it is to be kept for some time it will better be allowed to simmer. The tubes of the extract of pancreas are better than the tablets of the same, and may be procured ready for use from a druggist.

To peptonize completely, continue the heating process for two hours. Milk thus treated will be bitter in taste, but an infant will soon get used to the taste. For older persons a little lemon juice and sugar may be added to disguise the taste. Where the milk is to be used for very young children it is better to peptonize it full strength as above suggested, and then to dilute it as needed. There is objection to the continued use of peptonized milk as it usurps the functions of the stomach and the proper treatment of the diseases in which this is used is to strengthen the stomach and to render it able to do its own work without assistance. So peptonized food is used only to help it in its weakness and to restore its powers. When there are indications that this point has been reached the peptonized food should be gradually withdrawn.

Condensed Milk.—This, of course, is not so good as plain milk; yet it forms the staple article of food of many children. There are occasions when condensed milk is the only form in which milk can be either gotten or kept. In the process of manufacture it is necessary to remove much of the cream in order to dry the milk. This robs it of its fat; and, when it is used as infant's food, this must be supplied in some form. The easiest way is to give from five to twenty drop doses of cod-liver oil. In its natural state condensed milk is not to be given to children. For a very young infant, it should be diluted with twelve times its bulk of water. For a child of six months, six times the bulk; that is, six spoonfuls of water to one level spoonful of condensed milk. In this form it is, perhaps, more digestible than plain milk or than modified milk, but it is much less nourishing. When fresh cow's milk of good quality can be obtained, condensed milk should never be used.

Infant Foods.—However valuable these may be on occasions, it must be said that these preparations do not compare with modified milk as a permanent food. The chief disorders resulting from their prolonged use are scurvy in children and rickets. Some of them are intended to be used alone, or with the addition of water only; others, less objectionable, are prepared by the addition of milk.

Cow's Milk.—When for any of the many reasons the mother's milk is not suitable in quantity or in quality as food for the infant, and when a wet nurse is out of the question, as it so often is, recourse must be had to the next best article for the child's nourishment. This is cow's milk.

The essential points to be first looked to are that the milk used is pure and clean. Conditions attending milk supply have undergone a great change during the past few years, and it is now possible to meet both of these conditions with much greater success than formerly. In country districts these essentials are more directly under the mother's control than is the case in the city. But a little judicious inquiry will soon put one right in these matters. Milk is considered to be pure when it is delivered just as it comes from the cow, without adulteration or manipulation of any sort. The idea that one cow's milk is the best for an infant is an erroneous one. If that particular cow be affected by a disease, such as tuberculosis so common among cows, the danger of infection from the milk is greater than will be the case if that cow's milk be mixed with that of the rest of the herd which are healthy. Another point to be observed is that the milk be not more than twenty-four hours old when the child gets it. It is also important that the milk show a fair proportion of cream after standing a few hours. It is perhaps needless to say that the milk must be sweet and free from disagreeable odors or taste. These points are easily detected by a careful examination.

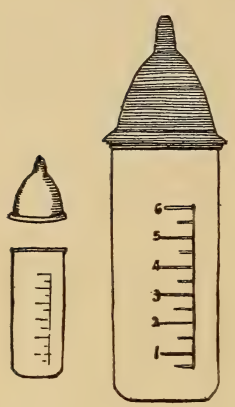

FIG. 64. AN EXCELLENT FORM OF GRADUATED NURSING BOTTLE, EASILY CLEANSED

Modification of Cow's Milk.—While mother's milk and cow's milk are composed of the same ingredients, they are not present in the same proportions. It is therefore necessary to so change the proportions of the cow's milk as to make it more nearly correspond to mother's milk. This change is called modification. To do this intelligently one must know the composition of both mother's milk and cow's milk.

In the first place both are largely made up of water, which is present in about the same proportion in both, namely, 87 per cent. Or, in other words, if 100 spoonfuls of either milk be taken, 87 spoonfuls are water; the other 13 spoonfuls, or 13 per cent, are composed of fat, sugar, proteids, and salts. It is among these that the disproportion exists. The fat is the cream; the sugar is milk sugar; the proteids are the curd of

the milk; and the salts are dissolved in the water of the milk. The fat or cream is about the same in both milks, and in 100 spoonfuls there would be about four spoonfuls of fat or cream in each. That is what is meant by four per cent of fat in the food. But the great difference in the composition of the two milks is in the proportion of the other constituents. In mother's milk there is 7 per cent of milk sugar, while in cow's milk there is only 4¼ per cent. There is only 1½ per cent of proteids, or curds, in mother's milk, while there is 4 per cent in cow's milk. There is ¾ of 1 per cent of salts in cow's milk, while there is only from 1-5 to ¼ per cent in mother's milk. So that in order to modify cow's milk to make it more nearly like mother's milk it is necessary to increase the quantity of sugar and to decrease the quantity of proteids, or curds.

The following table will show more conveniently the relative proportions of each constituent in the two milks:—

Mother's Milk.		Cow's Milk.	
Fat,	4 per cent.	Fat,	4 per cent.
Sugar,	7 per cent.	Sugar,	4¼ per cent.
Proteids,	1½ per cent.	Proteids,	4 per cent.
Salts,	1-5 to ¼ per cent.	Salts,	¾ per cent.
Water,	87 per cent.	Water,	87 per cent.

Why It is Necessary to Modify the Milk.—Simply because a child cannot digest it. Not only are the proteids, curds, present in too large proportions but even if reduced to the same proportions as are present in mother's milk they are then harder to digest than are the proteids in mother's milk. It is true that a child's stomach will in time become strong enough to digest it in its full strength, but that is not until the end of the third year generally and sometimes not then. It is also necessary to add sugar to the cow's milk, not to make it sweeter, but to supply the deficiency of sugar, which is real food to the child. As the child becomes able to digest the milk more easily as it grows older it is necessary to change the formula for modifying milk from time to time. Then, also, as the digestive power of children of the same age varies considerably it is necessary to modify the milk for one child according to one formula and that for another child according to another formula. It is usually the custom for the doctor to prescribe the proper proportions for mixing or modifying milk; but as the mother is on the ground all of the time, and as the methods of modifying are quite within her power to grasp easily, the best results are to be expected from her management.

How is Cow's Milk Modified?—The results which it is desired to bring about by modifying cow's milk are as follows:—

1. As cow's milk is acid and mother's milk alkaline, it is necessary to make the cow's milk alkaline by adding limewater.

2. As cow's milk contains less sugar than does mother's milk, it is necessary to add sugar to the cow's milk.

3. As cow's milk contains more proteids (curds) than does mother's milk, it is necessary to reduce the quantity of proteids by diluting the cow's milk with water.

4. When the cow's milk has been sufficiently diluted with water to bring about the proper proportion of proteids, the proportion of fat (cream) which was originally in the cow's milk has also been reduced. It is therefore necessary to restore the proper proportion of fat by the addition of cream.

FIG. 65. PROPORTION OF MILK TO BE TAKEN IN GETTING THE SEVERAL PERCENTAGES OF FAT.

The acidity of cow's milk is overcome by the addition of either limewater or the bicarbonate of soda (baking soda). It is best added last, after the other steps in modification have been taken. Then, if limewater is used, add one ounce of limewater to every twenty ounces of food. If bicarbonate of soda is used, add twenty grains of bicarbonate of soda to every twenty ounces of food.

Sugar is added after the dilution of the milk by water. Sugar of milk is to be preferred. It is true that it is more expensive than cane sugar. Some children will take the cane sugar very nicely; whether or not it agrees with a child is a matter of experience. The amount of milk sugar to be added to the food varies with the age of the child. During the first five months add one ounce of milk sugar to twenty ounces of food. The sugar is dissolved in water that has been boiled, and in this

way added to the food. If cane sugar is used, a much less quantity is required. Usually not more than half the amount of milk sugar, about half an ounce to twenty ounces of food, should be used. If more is added than is necessary, the sugar will ferment in the stomach and cause colic.

The proteids of cow's milk are reduced by the addition of water. We have seen that there is about twice as much proteids in cow's milk as in mother's milk, and it would appear at first sight that it would bring the right proportions if we add two parts of water to one of milk. This would be true if the proteids in both were of the same degree of digestibility. But the proteids of cow's milk are much harder to digest than are the proteids of mother's milk. So for very young infants it is necessary to dilute the milk with five or six parts of water to one of milk. This seems a great deal but it is all that the stomach of a very young child can stand. As the child grows older these proportions are considerably changed. By the dilution of the milk in the degree just referred to, it will be seen that the proportion of fat (cream) which the milk originally contained, has been very much reduced. In order to restore the proper balance, it is then necessary to add more cream. This may be done in several ways, but the most convenient is by using the top milk. It is quite plain that if a bottle of milk stands for four or five hours, the cream will rise to the top. If we take off all the cream and only a part of the remaining milk, we have a far richer fat food than if we take the whole of the milk. The average milk, as we have seen, is composed of four per cent cream. It is customary to speak of it as a four per cent milk. If we take the upper third of a bottle of milk that has been standing for four hours, we shall have ten per cent of cream instead of only four per cent. Such milk is called ten per cent milk. If we take the upper half of such a bottle of milk, we shall have seven per cent of cream, or a seven per cent milk.

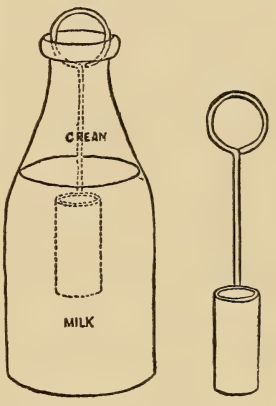

FIG. 66. A CHAPIN DIPPER AND METHOD OF USING TO TAKE OFF THE TOP MILK WITHOUT DISTURBING THE LOWER LAYER.

The removal of the top milk is best accomplished by means of a Chapin dipper. This holds one ounce of milk. It is used by pressing it carefully downwards on the surface of the milk, taking care not to disturb the contents while it is filling. It is impossible to pour off the top milk, so some such device as this is needed.

Formulas for Modified Milk.—It may be necessary in some cases to vary the time of change from one to another formula. If the child is digesting the milk and seems unsatisfied, it is well to advance to the next formula. But if on doing so the child is observed not to digest the milk well it will be necessary then to go back to the original for a little while longer. At the same time the child's weight should be frequently taken, and this will indicate whether or not the food is adequate.

For the Second Day.

Ten per cent Milk,.....2 ounces.
Milk Sugar,.....1 ounce.
Limewater,.....1 ounce.
Boiled Water,.....17 ounces.

Make up twenty ounces. Keep in bottles in a cool place, and keep the bottles corked with absorbent cotton.

Give from one to one and one-half ounces at a feeding every two hours during the day and twice during the night.

For the Fourth Day.

Ten per cent Milk,.....3 ounces.
Milk Sugar,.....1 ounce.
Limewater,.....1 ounce.
Boiled Water,.....16 ounces.

Keep as previously directed.

Give from one to one and one-half ounces at a feeding every two hours during the day and twice at night.

For the Tenth Day.

Ten per cent Milk,.....4 ounces.
Milk Sugar,.....1 ounce.
Limewater,.....1 ounce.
Boiled Water,.....15 ounces.

Keep as previously directed.

Give from one and one-half to three ounces at a feeding every two hours during the day and twice during the night.

For the Fifth Week.

(A little earlier in the case of strong infants with good digestion; and later in the case of delicate children.)

Ten per cent Milk,.....5 ounces.
Limewater,.....1 ounce.
Milk Sugar,.....1 ounce.
Boiled Water,.....14 ounces.

Keep as previously directed.

Give from two and one-half to three and one-half ounces every two hours during the day and once during the night.

For about the Seventh to Ninth Week.

Ten per cent Milk,.....6 ounces.
Sugar of Milk,.....1 ounce.
Limewater,.....1 ounce.
Boiled Water,.....13 ounces.

Keep as before directed.

Give from three to five ounces every two and one-half hours during the day and once during the night.

For the Third or Fourth Month.

At this period the child's powers of digestion have increased so that it is now able to take a greater proportion of proteids. This is secured by using the seven per cent milk, which is gotten by using the top half of the bottle of milk instead of the top third as formerly. The formula reads:—

Seven per cent Milk,.....7 ounces.
Milk Sugar,.....1 ounce.
Limewater,.....1 ounce.
Boiled Water,.....12 ounces.

Keep as previously directed and give from four to six ounces at a feeding every three hours during the day and once during the night.

Continue this formula for about ten days, after which:—

Seven per cent Milk,.....8 ounces.
Milk Sugar,.....1 ounce.
Limewater,.....1 ounce.
Boiled Water,.....11 ounces.

Keep as before and give from four to six ounces at a feeding every three hours during the day and once during the night.

Continue this formula for about two weeks, after which:—

Seven per cent Milk,.....9 ounces.
Limewater,.....1 ounce.
Milk Sugar,.....1 ounce.
Boiled Water,.....10 ounces.

Keep as before and give from four to six ounces at a feeding every three hours during the day and once during the night.

For the Fifth and Sixth Months.

Seven per cent Milk,.....10 ounces.
Milk Sugar,.....1 ounce.
Limewater,.....1 ounce.
Boiled Water,.....5 ounces.
Barley Gruel,.....4 ounces.

Keep as before and give from five to seven and one-half ounces at

a feeding every three hours during the day. The night feeding may now be omitted.

For the Seventh, Eighth, and Ninth Months.

Seven per cent Milk,.....11 ounces.
Milk Sugar,.....¾ ounce.
Limewater,.....1 ounce.
Boiled Water,.....3 ounces.
Barley Gruel,.....5 ounces.

Keep as before and give from five to seven and one-half ounces at a feeding every three hours during the day. The night feeding is now omitted.

In the Tenth and Eleventh Months.

At this time we begin to prepare the child for a plain milk diet. This is done gradually; one feeding a day of plain milk and barley water; then later two feedings a day; then three a day; and so on until a plain milk diet is very slowly obtained. At the beginning of this plan the child should take as one of his feedings each day for about two weeks:—

Plain Milk,.....5½ ounces.
Barley Gruel,.....2½ ounces.

At the end of two weeks of such feeding he should get two such feedings a day. The two feedings should be given for about another two weeks, then three feedings a day should be given. After these have progressed for a week, the quantity of plain milk may be increased to:—

Plain Milk,.....6 ounces.
Barley Gruel,.....3 ounces.

This is given for a week or so at the rate of three feedings a day, then increased to four feedings a day. Probably this number will have to be continued for more than two weeks; a month would be better, during which time the quantity may be still further increased to:—

Plain Milk,.....7 ounces.
Barley Gruel,.....2 ounces.

By the time the child is fifteen months old he should be taking plain milk at the rate of five feedings in the twenty-four hours, at intervals of about four hours apart. The barley gruel may be continued and fed separately by a spoon. By the end of the first year the child may take some fruit in the form of orange juice, the white of an egg, and some beef juice.

Diet for a Child of One Year.

6.30 A. M.:—

Plain Milk,.....7 ounces.
Barley Gruel,.....3 ounces.
Granulated Sugar,.....½ teaspoonful.
Salt,.....1 pinch.

10 A. M. Same as above.

2 P. M.:—

One or two ounces of Beef Juice, three times a week.
A Soft Boiled Egg,.....twice a week.
Chicken or Mutton Broth, from 4 to 6 ounces, twice a week.

Plain Milk,.....3½ ounces.
Barley Gruel,.....1½ ounces.
Sugar and Salt, ...to suit.

6 P. M. Same as first meal.

10 P. M. Same as first meal.

Diet for a Child Fifteen Months Old.

The number of meals and the hours of feeding remain the same as given for a child of one year. Milk continues to be the chief article of food and remains so for the next two or three years. In the morning ten ounces of milk are given, more or less mixed with barley, wheat, or oatmeal gruel. This is being gradually lessened so that the milk is approaching plain milk as fast as the stomach of the child will accept it. As has been pointed out there is a very great difference in the capacity of children to take plain milk; and the proportions as well as the quantities named in the formulas are subject to considerable change. A strong, hearty child with good digestion may be several weeks ahead of a delicate, small child in the matter of quantity and strength of the mixture. This is purely a matter of experiment and all changes made must be introduced very carefully and with attention to the digestion of the food and the increase in weight of the child. Some children are so susceptible to changes that the too early or too rapid change to a new diet is attended with marked digestive disturbance. In such cases it is necessary to go back to the former diet for a time; and in some cases going back two or even three steps for a day or two may be necessary. Instead of mixing the gruel with the milk, it may be possible to give it separately at the second meal. It is then limited to two teaspoonfuls of cereal, such as oatmeal, or wheaten grits. The essential thing in this preparation is to see that the cereal is cooked

for three or four hours. It is strained and served with a little cream. As the child has had cream with the cereal, it can take plain milk in less quantity than was given at the first meal. The third meal is the heartiest of the day. That is the time to give beef juice, and if the teeth are well through some scraped beef or mutton pulp may be given. The amount is limited at first to a single teaspoonful at a meal. Well boiled rice, very stale bread, at least a day old, or zwieback, a tablespoonful or two of the pulp of prunes (the skin must be carefully removed), and a small quantity of milk will make up the meal. The milk at this age is to be taken from a spoon, or, better, from a cup, except for the last meal of the day, when it may still be taken from the bottle. The fourth meal may be made up of milk with the addition of some arrowroot or similar food. The last meal of the day is made up of plain milk.

Diet for a Child Two Years Old.—The first meal is still composed of plain milk. The second is of cereals, which no longer require to be strained. A thin slice of stale bread may be given without butter, for the child has had all the fat that is needed in the cream used on the cereal. The third meal is made up of the pulp of beef or mutton; broths may be used three times a week; on other days a soft boiled egg mixed with bread crumbs; stale bread, no butter, and prune pulp. It is advisable not to give milk at this meal, water is much better when meat forms a part of the meal. Baked apple or apple sauce without much sugar may be used instead of the prune pulp. Raw apples should not be given. The fourth meal consists, as before, of arrowroot, barley, cornstarch, or bread and milk. The last meal is, as formerly, composed exclusively of milk.

Diet During the Third Year.—Very early in the third year the last or fifth meal may be dropped, and the hours of the other meals will be as formerly at from 6.30 to 7 A. M., 12 to 1, 3.30 to 4, and 6.30 P. M. It may be, however, that the child will have difficulty in going to sleep without the accustomed late meal. In such cases the child may be given a cup of warm milk for a time in place of the last meal. Very strict observance of the rule that when the meals are given regularly and promptly there should be no eating between meals is now of the highest importance. Now, also, he should be taught to chew his food well. So much in the way of good digestion depends upon how well this act is performed. Besides the child is now beginning to eat a greater variety of food, and digestive disturbances are very easily excited at this time. In order to restrict a child's diet to proper articles,

it is vastly better that he take his meals alone rather than with the rest of the family. Where there is more than one child this is often easier to manage than in the case of a single child. It is quite unreasonable to expect a child to sit at the table with adults and not be expected to ask for the food prepared for them.

Milk forms a large part of the child's diet until the period of the second teething. It may be regarded as the principal article of food both in sickness and in health during the third and fourth years. In cases of digestive disturbance it is the best food to turn to, because by dilution with water it is so easily capable of being readily adjusted to the child's powers of assimilation. It will be seen when these digestive irregularities are discussed that it is sometimes necessary to put a three-year-old child back for a time on even first year modification of milk in order to supply him with food that he can digest. The cream is always an important article of food; for in health it supplies a child with the needed proportion of fat, and in constipation it is useful as a natural laxative. When no longer mixed with the milk to modify it, it is eaten with cereals, and the amount taken is to be regulated by the condition of the child's bowels. Where cream is eaten in any quantity, say two ounces at a meal, there is no need of giving the child butter, for this it must be remembered is only another form of the fat of milk.

Eggs may be introduced at the latter part of the second or first part of the third year. It is perhaps needless to say that they are never to be given fried to any child. Some form of soft boiling, or poaching, is the best way. They are not to be given more than three times a week, because if given oftener there is great danger that the child will get tired of them. The list of foods which a child at this age may take safely is naturally limited and it is well to be able to supply a change when required. So when a child shows signs of tiring, even in slight degree, of any one article another should be at once substituted.

Meats are valuable food when well chosen. The first form in which they are given is as broth and meat juice. There is very little nourishment in broth. Their chief use is as a stimulant. An adult takes a small quantity of soup at dinner not as a food article but as a preliminary to excite the function of the stomach to the more serious work which is to follow. They do form excellent vehicles to convey more nutritious matter in the form of barley, rice, vermicelli, and vegetables. With the exception of potato soup all such are to be strained before feeding. The plainer they are made the better. Beef juice is more nourishing and is prepared either by a meat press or by extracting the

juice with water. The meat press is much the better way of preparing the juice. The meat is first browned slightly on a quick pan so as to sear the outside and to start the juice. The meat is not cooked and the pan must be very hot, yet the meat must not be burned. It is then put in the press. It is better to prepare the juice as required; only one or two ounces of the juice, according to the age of the child, will be needed at a time. A lemon squeezer will answer the purpose of a meat press very well. Another way without using the press is to take a pound of very lean chopped beef, place it in a jar and pour on eight ounces (half a pint) of water and allow it to stand for eight or ten hours. The water is then poured off and the rest of the juice is squeezed out of the meat by wrapping it in coarse muslin. In all cases a little salt is added to the juice and it is to be given at a heat of about 100°. If the child does not take it well in this form it may be added to the milk, where it will not be noticed. But the milk must not be heated above the 100° mark, as the albumen in the beef juice will be coagulated by greater heat. Practically the only kinds of meat which a child can take are beef and mutton. In poultry he is limited to fowl and turkey. The meat of young, immature animals is not to be given, for it is indigestible. This precludes lamb, veal, and chicken. This does not mean that old, tough birds and animals are to be chosen, but that the animals and birds while young must be full grown. The meat in all cases is to be given rare, and at first it is scraped after cooking. This supplies a sort of pulp which is quite within the child's powers of digestion and of mastication. Broiling the beefsteak or the chop is the best way to cook the meat. From one to two tablespoonfuls of the scraped pulp at the midday meal is the way it is best taken.

Fish is a permissible article of diet for young children with certain very well defined limitations. Only absolutely fresh fish may be safely given. Salted or smoked fish are never to be given. Some fish, such as salmon and herring, are too fat for young children. Oysters may be given stewed rather as a change and a treat than as a frequent dish. Oysters and clams may be used to make a thin soup, but all particles of the meat must be removed before serving. The best way to prepare fish is to broil or boil them. But fish are never to be served to children with a rich sauce. A little cream may be added, but a sprinkling of salt is all that is needed.

Among the vegetables suitable for children the potato takes the first place. The white potato is better than the sweet potato, as the latter is so seldom as mealy as is necessary to easy digestion. Baking produces

a more easily digested food than boiling. Potatoes are never to be given stewed or fried or sauted. New potatoes are not ripe and are unfit for children. Well cooked, tender asparagus tops, tender peas, string beans, cauliflower, and spinach are within the digestive abilities of young children. Dried beans are not safe food for children under six. Spinach is the chief vegetable for winter use. Canned vegetables are not to be given. Celery may be given if stewed, but never raw.

DISEASES OF CHILDREN CAUSED BY IMPROPER FEEDING.

RICKETS.

A disease of early childhood marked by changes in the bones, with consequent deformity, muscular weakness, and nervous disturbance. It usually appears between the ages of six months and two years.

Causes.—It is markedly a disease of improper feeding. Artificially fed children suffer most from it. Children fed with proprietary foods are very subject to it, because these foods are deficient in fat and too rich in starch and sugar. The same is true of condensed milk. When improper feeding is combined with an unhygienic mode of life, such as foul air, lack of sunshine, dampness and poverty, the disease is almost certain to appear.

Symptoms.—A change in the shape of the head and deformity of the limbs, due to disease of the bones, may be among the earlier symptoms. The head becomes square or box-like in appearance; the bones of the forehead over the eyes become prominent, as do also the bones at the back of the head. This gives the head the appearance of having four corners. The long bones of the legs become soft and unable to bear the weight of the body, so that bowlegs and knock-knees are produced. The chest becomes pigeon-breasted and there is often curvature of the spine. The joints at the wrists and ankles become enlarged; and along the sides of the breastbone the ends of the ribs at their points of union with the breastbone assume a rounded shape much like marbles. These take the name of the "rachitic rosary." Very often there is restlessness at night; feverishness; profuse perspiration of the head, so that the pillow is often found wet; slight diarrhœa; nausea and vomiting; and the peculiar enlargement of the abdomen caused partly by the accumulation of gas and partly by the loss of tone in the abdominal wall.

Teething is usually slow, and the teeth are generally very irregular when they do come. Nervousness and sometimes convulsions are to be observed in many cases.

Prognosis.—Children do not die from rickets, but their power of resistance to other diseases which they are very liable to contract is so much lessened that they succumb to one of them. The deformities caused by the disease are often permanent, especially in cases of great severity or in those in which there has been considerable progress before it was detected.

Treatment.—The treatment calls for an immediate change of the diet. If the child is being breast fed, modified milk adapted to the age and digestive powers of the child must be substituted. If the child is taking a proprietary food its use must be stopped or limited. Starch and sugars are to be reduced to a minimum or prohibited altogether. If the child is old enough it should have beef juice, eggs, scraped beef or beef pulp, and fresh fruit, especially orange juice. The deficiency of fat is to be supplied by cod-liver oil given in doses of from five to twenty drops at the beginning according to the age of the child. It must not be given in quantities beyond the power of the child to assimilate. Bad hygienic conditions are to be overcome by giving the child the maximum of fresh air. If he can live in the country, so much the better; and he is to be encouraged to take all possible outdoor exercise. Cold sponge baths, if they can be borne, and plenty of sunshine are in themselves valuable remedial agents.

If the deformity of bowlegs is not very pronounced the chances are very good that the child will outgrow them in a great measure, if not entirely. The use of braces to correct the deformity is not always successful; and where the legs are much bowed it is as well to let them alone until the child is five or six years old and then have an operation performed by a skillful orthopædic surgeon.

SIMPLE WASTING OR MARASMUS.

A gradual wasting of the tissues of the bodies of infants usually without attendant organic disease.

Causes.—Insufficient or imperfect food supply; poor digestion; unhygienic living; or weak constitution. There are loss of weight, poor circulation, imperfect breathing, and consequent impoverishment of the blood. The child gradually wastes away until it is little more than skin and bone; the stomach is abnormally large; anæmia with marked pale-

ness is a prominent symptom. The stools contain a quantity of undigested food and are often otherwise normal, or contain a small quantity of mucus. Vomiting is also common; and the appetite is poor. In the last stages the child will eat nothing, and, unless fed forcibly, will die of starvation.

Prognosis.—When the disease attacks children under four months of age the chances of recovery are not good; the later it appears the better the prognosis. A history of the cases shows that those who recover, do so completely, and at three years of age are quite vigorous, though their weight and size may be below the average of that age.

Treatment.—A radical and complete change in the diet of such children is the first necessity. This generally requires the services of a wet nurse or the employment of modified cow's milk. The modification of the milk will probably be lower than that of a child of the same age in good health. It may be necessary to employ a very dilute form, as the great need is milk of a quality and strength that is within the power of the child to digest easily. It is usually necessary to peptonize the food so as to predigest it. This is practically the condition which affects children of premature birth, and those of an enfeebled constitution. In such cases it will be necessary to follow the directions for the care and treatment of such children. As the breathing of these children is only partial, it is advisable to use such means as will cause them to breathe more deeply. This is effected by their crying. When this is produced by spanking the child, the method seems a little inhuman, and the same result can be produced by giving the child a cold sponge bath quickly just after the warm bath. This must be done hastily and without exposure. Good, intelligent nursing counts for much more than medicine. Plenty of fresh air, if the child is able to go out and the weather is fit, and ventilation of the room by day and night, with frequent systematic airing of the room, are indispensable.

SCURVY OR SCORBUTUS.

A constitutional disease, which most commonly affects the children of the well-to-do. While children of the poor are more largely affected by rickets, the children of those in more comfortable circumstances suffer from scurvy.

Causes.—These are essentially errors in feeding. A child may receive food of good quality, yet it is often lacking in important constituents. The disease is the result of long continuance of errors in diet.

Cases may develop from feeding of any sort of food; but the greater number are seen in children who are fed on sterilized milk, condensed milk, and prepared foods.

Symptoms.—One of the earliest symptoms is marked pain and tenderness of the legs. This is often so great as to cause the child to cry out when the parts are handled; and often causes a suspicion of rheumatism. But very soon the characteristic symptoms appear in the mouth: purple, swollen gums, which bleed very easily; even a slight rubbing of the gums will provoke bleeding; the gums may swell so as to completely cover the teeth; swelling of the joints; the occurrence of "black-and-blue" spots around the joints, caused by a hemorrhage under the skin; loss of power in the limbs which suggests paralysis; the child is anæmic, and internal hemorrhages occur, the blood being voided by vomiting, in the stools, or in the urine.

Prognosis.—If the disease is detected in time and proper treatment given, the recovery is very rapid; but where the disease has made considerable progress unobserved, the prognosis is not favorable in young children. Fatal cases usually run for from four to six months, or sometimes less.

Treatment.—As in all cases of disease from faulty nutrition, the first step is the correction of the diet. In most cases this, if properly done, is all that is required to effect a cure. A properly modified cow's milk diet will produce rapid changes for the better. This modification and the degree of dilution is a matter of experiment. To this is to be added the juice of ripe fruit, especially that of the orange. This should not be given with the milk, but about an hour before, and should amount to from one-half an ounce to three or four ounces a day, according to the age of the child. If there is diarrhœa, resulting from intestinal indigestion, the fruit juices should be given with great caution. The presence of complications, of course, affect the treatment. Where there is anæmia, the bitter wine of iron, cod-liver oil, and nux vomica are called for after the other symptoms have subsided under the influence of good diet. On account of the extreme pain and tenderness of the limbs, in most cases, the child should be handled as little as possible. While fresh air is important and must be provided, there is need of great care to prevent exposure, as such children are very susceptible to cold.

In the case of an older child the diet will be varied by the use of beef juice and fresh vegetables. The potato especially is of value; in winter, spinach is the most valuable fresh vegetable.

DISEASES OF THE DIGESTIVE ORGANS.

MALFORMATIONS OF THE MOUTH.

Harelip.—The development of the parts has been arrested so that there is no union. The opening in the lip is never in the middle line of the face, but on one or both sides, under the opening of the nostril. It is either single or double.

Symptoms.—The only symptom is the evidence of the deformity. The deformity may be so great as to prevent the child from nursing through inability to grasp the nipple. That leads to imperfect nutrition, and it will be necessary to operate at once. Where the deformity is not so great as to interfere with nursing, the operation will better be postponed until the fifth month.

Treatment.—The operation is quite simple, calling only for nicety of adjustment of the parts so as to leave very slight traces of the healed wound.

Cleft Palate.—This is a similar lack of union through arrested development. It frequently accompanies harelip, and the parts involved vary in different cases.

Symptoms.—There is the evidence of deformity, and when the child is old enough to begin to speak, there is noticeable a characteristic imperfect utterance. Sometimes the deformity is so great as to interfere with nursing, and the operation must be performed at once. Otherwise it is better to postpone it until the tenth year.

Treatment.—There is the greatest need of cleanliness during infancy, as the accumulation of particles of food in the uneven surfaces of the mouth induces thrush, and other forms of sore mouth. The operation is more difficult that that of harelip, but it is not attended by any danger.

Tongue-Tie.—This form is caused by the undue shortness of the membrane (the frenum), which is attached to the tongue on the underside.

Symptoms.—The earliest indication of it is usually a difficulty in nursing, and the inability to thrust the tongue out. It can be detected when the child opens its mouth in crying.

Treatment.—Unless the defect is so great as to interfere with nursing, no operation is needed. If a child can thrust its tongue out beyond the red edge of the under lip, it is not to be regarded as an infirmity. Where an operation is called for, it is very easily performed by the cutting of the frenum.

TEETH AND TEETHING.

What we may expect to occur in the case of the normal development of a child's teeth will largely depend upon how the mother shall care for baby's mouth. So in the beginning, let our watchword be, Cleanliness. In these scientific days, cleanliness means more than ever before. It is to this word we must give the credit as being the foundation for success in the treatment of many infectious diseases. And it is to this one thing in the work of sterilization that modern surgery owes much for its success. As well is it a most important factor in the treatment of dental affections, for the necessity of sterilization is founded upon just as firm a basis as is the science of mathematics.

When the baby is very young, its mouth should be cared for many times daily to insure healthy mucous membranes and gums, by washing it out before every nursing, to prevent any infected mucus or any other foreign materials from being carried into the stomach to cause indigestion.

To do this in the best and easiest way, procure a glass-stoppered bottle, fill it with a saturated solution of boracic acid, being careful to scald the bottle beforehand for this purpose, to insure sterilization. To prepare this solution, add to one pint of water, which has been previously boiled, one heaping teaspoonful of boracic acid, shake well, and it is ready for use when dissolved. Water prepared for this purpose should be boiled at least ten minutes and should not be left in an open vessel exposed to the air, for the air, being laden with bacteria, would soon rehabitate the water, defeating the object of boiling entirely.

Having this solution mixed in the proper proportion and in the bottle for use, pour a small quantity each time into a cup or shallow dish, enough for one cleansing only, never using solution the second time or pouring it back into the supply bottle. By wrapping a piece of clean absorbent cotton around either the index or little finger, dip into the solution and wash thoroughly the inside of the cheeks, around the gums, and both the under and upper sides of the tongue. If much mucus be present it may be necessary to use many pieces of cotton to cleanse these surfaces, but never introduce the same piece into the mouth or the liquid the second time. If sterile cotton for this purpose is not available, any fabric in white may be made sterile by the use of dry heat in an oven, at any temperature over 212 degrees, for forty minutes. Cloth prepared by this method should be cut into appropriate size before baking, so it will not have to be handled afterwards until ready for use. Place in a covered jar ready for use, using a fresh piece for each washing.

The mother's nipples should be washed with the same solution before nursing.

For a bottle baby, much care should be exercised in keeping the rubber nipple clean, as here is the source of many mouth affections in infantile life. The rubber nipple should be scalded and put into a solution of borax until needed.

Early in infant life we should begin to prepare our baby for an ordeal which only those who have had recent difficulties in cutting a wisdom tooth could appreciate, if they were to multiply their troubles by two to four fold. Now, of course, baby's food must be of a suitable character, which must be determined by many experiments.

The food being right, the baby being healthy, I would say give no solid food until dentition is nearly completed; and that prior to dentition, use limewater to build up bone and aid digestion. In many cases the use of cod-liver oil in an emulsion has proven a great help to infants cutting teeth, as it not only tones up their system as a nourishing food, thereby aiding dentition, but, being rich in phosphates, aids in the development and hardening of the bones.

The shape, size, and color of the teeth being a matter of heredity is not ours to change, but we may do much to help to make them hard and firm, beautiful and useful. We may also do much, in many ways, to insure a symmetrical face with harmonizing teeth and jaws, by guarding against a most natural habit about which I wish to caution mothers in most emphatic terms; a habit most natural, and altogether innocent, so often formed in infancy, to the gratification of the erring mother, until its disastrous influence upon the facial expression of the child has become so thoroughly moulded that it is beyond the control of any power except that of a skilled specialist to correct, both at the expense of the child's comfort and of the parent's money.

The habit to which I refer is that of thumb-sucking. It may be easily understood how a decided change in the formation of the jaws can result when any force is brought to bear in an abnormal direction upon a structure which is just being built up by the work of cell formation, when we think of the possibilities of moving a fully formed tooth, or a number of them, in a fully formed jaw; by the use of the application of the most minute but constant force through the agency of special appliances, for a period of time, they can be moved in any direction required almost without limitation. On the contrary, think of the structure of an infant's jaw at birth; being composed of two segments from which it is developed, these very delicately united,—only by a fibrous symphysis

in which ossification is not complete until the end of the first year, which is then of only inferior density, as an increasing hardness will still continue to manifest itself until the end of maturity.

It is during the period of developing bone structure that the innocent babe contents itself with Nature's time-honored pacifier, thus heaping upon itself the foundation for criticism of its beauty and expression, while the mother is feasting her mind upon pleasant thoughts of its peaceful disposition.

Not only does this practice in babies affect the jaws, but the teeth may be badly displaced, for it is during this time that the tooth follicles are at work building up baby's teeth.

The work of the great Architect must go on, even though interfered with in many ways, and if the teeth are blocked from their normal passage through the gums they will take some other course, resulting in a badly disarranged dental arch.

Facial deformities are by no means always acquired, as they are often a matter of inheritance or undue development of certain portions of the face, for a child may inherit a distinct irregularity just as easily as any other distinctive feature as a primary heredity. Secondarily, it may inherit separate peculiarities which combine to cause irregularities of the teeth; for instance, large teeth may be inherited from one parent, and small jaws from the other, producing an irregularity of some kind, yet not inherited directly from either. Also, as a child may inherit tone of voice, peculiar gait or other habit, so he may inherit a habit which will cause an irregularity of the teeth. The intermarriage of different races might also be given as a cause of indirect heredity of irregularities. There are also many local causes for irregularity of teeth, notably among which are to be considered, first, too long retention of deciduous teeth; second, too early extraction of deciduous teeth; third, injudicious extraction of permanent teeth; fourth, delayed eruption of permanent teeth.

The cause of an abnormally high palate or vault, a narrow upper arch with protruding upper and retruding lower teeth, forming what may vulgarly be termed a parrot mouth, can be directly traced and easily observed by anyone who has ever seen a baby lying in a crib sucking its thumb. In this recumbent position, with the palmar portion of the thumb (that portion continuous with the palm of the hand) resting firmly with a constant force upon this partially developed palate, the dorsal portion, or back of the thumb, resting upon the lower lip and chin as a fulcrum, the weight of the arm as a lever bringing a constant force to

bear upon the lower jaw, in a backward direction, causing not only a very unsightly deformity to the face but a decided malocclusion of the teeth, rendering them almost useless, in many cases, for performing their intended work.

The eruption of the deciduous teeth commences with the central incisors from the fifth to the seventh month, followed by the lateral incisors from the seventh to tenth month; then the first molars from the twelfth to fourteenth month; then the cuspids or canines from the fourteenth to twentieth month; and, lastly, the second molars from the eighteenth to thirty-sixth month.

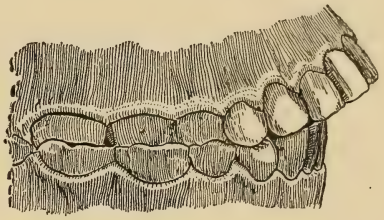

FIG. 67. DEFORMITY OF TEETH CAUSED BY THUMB SUCKING IN CHILDHOOD.

This process usually takes place in pairs, with a slight intermission between each class, and, as a rule, the lower teeth are erupted a little before the corresponding ones of the upper jaw, due probably to a better circulation of blood through the lower jaw than the upper, affording more nutrition, thus more vitality to the tissues. The lower cuspids or canines, from an old tradition, are popularly called stomach teeth, and the upper cuspids called eye teeth, it having been supposed by our forefathers and mothers that the eruption of these two teeth caused a disturbance to the stomach in the case of a lower cuspid tooth, and to the eyes in the eruption of the upper cuspids. But from the fact that at this time very important changes are going on in the whole system,—the organs of digestion are beginning to adapt themselves for the digestion of other food than milk, and because of all these changes there is, during this period of dentition, an increasing susceptibility to nervous and digestive troubles, requiring more than ordinary watchfulness of the child on the part of the mother, and it is perfectly natural that we should expect such disturbances. And that because baby is going to cut a stomach tooth is no more of a reason why we should expect a disturbance in the stomach than if he were going to cut any other tooth, for I have seen children in convulsions, caused by the eruption of a molar tooth, followed by a severe course of gastro-intestinal trouble.

An exposure to cold, an attack of indigestion—anything which induces discord within the organism—may result in a disturbance in the process of dentition, and the reverse may be experienced by the process of dentition, often bringing on grave constitutional disturbances, as well as to exaggerate any ailment of a child which may exist during this time.

As a rule, the severity of the attack is dependent upon the number of teeth advancing simultaneously, but owing to the varying susceptibility of individuals a single tooth may cause more trouble in one case than a number of them in another.

The drooling, or flow of saliva, which accompanies the eruption of teeth, is the method Nature has instituted for allaying inflammation by keeping the gums moist and cool.

Heat, redness, swelling, and pain are indications of an advancing tooth in the jaw, and are the normal symptoms to be expected during teething, and so long as there are no indications of systemic trouble, such as high fever, vomiting, diarrhœa, etc., everything will go on safely. But when there is a hard, pearly whiteness over the area of the on-coming tooth, with dry mouth, and baby very feverish, fretful, and sleepless, the gums must be lanced, as failure in this simple operation has often resulted in convulsions, which are sometimes fatal, through the severe disturbance of the system which is apt to follow them.

Indications for lancing gums, however, are not always manifested locally, and the absence of such indications is by no means always a contra-indication to lancing, for without them there may be numerous systemic disturbances due entirely to the process of dentition, and which may be entirely alleviated by lancing of gums.

The object of lancing is to divide the gum tissue which binds the tooth down, to allow it free egress. Sometimes lancing is necessary for partially erupted teeth, as often the cusps having pierced the gum, the tooth may be held back by the bands of tissue which draw over the surface of the tooth between the cusps, requiring a division of these bands to give relief. The relief from lancing usually follows immediately.

In the case of my own child, who had been feverish and fretful for two days, requiring constant care day and night in the arms of either my wife or myself, becoming alarmed at advancing systemic disturbances, I called in a neighboring dentist to assist me in this operation (the mother's feelings being of too delicate a nature to witness such a procedure), which was accomplished with little inconvenience even to the baby, giving immediate relief, as the child was asleep within a half hour as quietly as in normal health, remaining asleep for nearly the entire afternoon, awakening with normal temperature and appetite.

By many it has often been urged that in case the tooth does not erupt immediately after lancing, cicatricial or granulation tissue is formed over the tooth, which will again bind the tooth down, but, as cicatricial tissue is of lower organization than normal tissue, it is more easily broken down

than before, and would be an argument in favor of, rather than against, lancing.

The lancing should be thoroughly done by either a dentist or physician. The lancet should pierce the gum until it grates upon the tooth, clearly dividing all overlying tissues, when the pressure will be relieved and the trouble probably cease, but should systemic symptoms again develop it should be repeated, for it does no harm to be repeated as often as is necessary. The pain incident to such an operation is very slight and of short duration, as the tightly stretched tissues possess little nerve sensation in their superficial layers. In this state of high tension, the operation tends rather to relieve than to cause pain.

Eruption of the teeth occurs just as soon as they are hard enough for use, their hardness being dependent upon the amount of lime salts in them, as distinguished from purely animal matter, so that in many cases where children have not the diet which furnishes these elements, there is a consequent retardation of dentition, which by reason of a lack of vital force within the system often produces a decided disturbance to the system, manifesting itself in a great many ways.

The gum is absorbed away to make room for the on-coming tooth by pressure of the tooth against it. Coincidentally with this process, the little capsule which has held the tooth all these months is being converted into bone to become a socket for the tooth.

The principal difference between the structure of the temporary and that of the permanent teeth is that the temporary teeth contain more organic matter, both in pulp contents and in structural make-up, than the permanent ones, causing them to be softer and more liable to decay. The pulp tissue comes nearer the surface than it does in the permanent ones, making the work of destruction much easier and more rapid upon this vital tissue than in the permanent ones. Consequently, their care is more essential than that of the permanent ones, for as they have most important functions to perform it is desirable that they be retained until their successors shall come in. For not only do these little teeth serve the important purpose of mastication during a period of rapid growth, but they also assist in the development of the jaw during this time, so that their early extraction may decidedly retard its development, causing not only a marked influence upon the expression of the face, but a very crowded condition of the second teeth as well.

Considering the serious loss which their absence entails upon the workings of the entire economy, temporary teeth should not under any circumstances be neglected. They should not be allowed to decay,

neither should they be extracted too soon. Under normal conditions their roots will become absorbed and their crowns drop out, without the assistance of even a string. It seems to be the function of the pulp to absorb the roots of a temporary tooth to prevent the pain which would otherwise be necessitated by their extraction.

But if the decay be not arrested in them, it will encroach upon the minute nerve fibers which radiate out from the pulp through the structure of the dentine, providing in time such an irritation to the pulp tissue that it finally dies, defeating the great purpose of Nature to absorb these roots, not only subjecting the child to the severest kind of a toothache, until a gumboil forms, but leaving the space which is to be occupied by the new tooth filled up with the dead roots of the temporary one, causing the second tooth to be forced to the one side or the other on its way out through the gum.

This suggests, first of all, cleanliness for their preservation; inasmuch as immunity from decay cannot come locally through any other avenue than cleanliness, this necessitates their careful attention from the very start.

Children should be taught, as early as possible, the use of a toothbrush after every meal, and until this can be done the cloth washing, at least twice daily, should be kept up by the attendant, while the brush should be used once in between in order to remove particles which are inaccessible by a cloth. The brush used for this purpose should be small, having uneven rows of bristles suitable for an adaptation to the spaces between the teeth, and should be of a medium harshness, as a brush too soft does not stimulate the gums sufficiently, while one that is too harsh will irritate them, causing them to bleed.

It is not sufficient to brush teeth only upon their outer surfaces. They should be brushed up and down and across both inside and out.

Good toothbrushes are made in abundance, as well as pleasant dentifrices, and they are to be used for children as well as for adults. Such care as this, providing general health is good, will save the child much suffering, and will insure firm, healthy gums and mucous membrane as well as hard and pearly teeth to prepare the food for swallowing, so that it will be taken into the stomach in good condition to be digested.

Slow and thorough mastication is one of the requirements for health, so we should encourage the child to take a long time for meals; eat slowly and chew thoroughly. Cereals are the best food to supply bone salts, but a mixed diet is of a necessity to furnish all the elements required for

a growing child, after he has become old enough to digest solid food—we will say from the age of three years.

The mother should see to the cleansing of baby's teeth and mouth, as no one else would have the interest in it to do it so well as she, and a habit of this kind established in childhood will never be forgotten by the child. After the child is two or three years of age he should be taken three or four times a year to a good dentist to see if perchance, in spite of care, there might not be some cavities to be cleansed and properly filled.

Indeed, the importance of filling children's temporary teeth is often overlooked by even dentists themselves, as these teeth are supposed to be lost so early as to render such operations unnecessary. But as there are remedies known to dental science which have a power to materially retard decay when applied upon the surface of a cavity, and which are inexpensive and productive of great good, there need be no excuse for not taking some preventive measures against the decay of children's teeth.

There are three reasons why temporary teeth should be filled: first, to prevent suffering of pain; second, to allow of proper mastication of food; third, to preserve the fullness of the arch for the permanent teeth, and with this last object in view I would most emphatically proclaim the importance, above all other teeth, of retention and care of the first permanent molar, which comes in back of all the baby teeth at about the age of six years, and is so often mistaken for a temporary tooth until it is far beyond any method of restoration, except by the means of crowning as a last resort, limiting the usefulness to the average life of a crowned tooth, which will only carry the child into young manhood or womanhood, when it must be lost, after all the other teeth are in place and firmly seated, leaving a space which remains there throughout life.

The first permanent molar has often been referred to as the keystone to the dental arch, as its early extraction causes the malposition of other teeth, allowing them to occlude improperly, not only throwing an additional strain upon some of the teeth as well as preventing thorough mastication, but often producing a decided change on the facial expression by this abnormal occlusion of the upper and lower teeth.

The teeth should meet each other so as to interlock, as do the cogs of a wheel; and it is this condition in the arrangement of our teeth which we should seek to attain in their care and management, and it is the loss of the first permanent molar which most often disarranges the whole occlusion.

But in case this tooth be innocently neglected until it becomes badly

broken down, it would insure a far better future condition to have it removed before the tenth year, so the second permanent molar which erupts at from the twelfth to fourteenth year will come forward, and together with the wisdom tooth, or third molar, fill in the space and show a pretty fair complement of teeth at maturity, which will be comparatively regular in position.

In case of children who cannot be brought to a dentist for any reason, it is valuable to know that a little carbolized resin applied in the cavity of an aching tooth on a pellet of cotton will not only stop a severe toothache for the time being but will keep a tooth in a comfortable condition for weeks, as it hardens in the cavity sufficiently to prevent the pressure of mastication from irritating the exposed nerve.

CATARRH OF THE MOUTH OR CATARRHAL STOMATITIS.

An inflammation of the lining membrane of the mouth and of the tongue. The mucous membrane of the mouth and tongue is red, swollen, and coated with a thick slimy mucus. There is considerable pain. The disease is common in infants and children.

Causes.—It is caused by teething, stomach trouble, and certain fevers, such as scarlet fever, measles, etc., and the use of foods that are too hot or irritating.

Symptoms.—The mucous membrane of the mouth becomes more or less red, dry, and hot. There is some burning and smarting pain and an excessive flow of the salivary secretions. The breath is foul; the tongue coated; there is an unpleasant bitter taste in the mouth; feverishness; and disturbance of the stomach. The condition lasts for a week, sometimes longer. Chronic cases found in adults may be due to the abuse of tobacco or alcohol.

Treatment.—

Honey,.....2 tablespoonfuls.
Borax, powdered,.....½ dram.

Mix well together, and take a teaspoonful twice a day. The mixture should be placed in the mouth, little by little, touching the various ulcers that are visible.

Or:—

Chlorate of Potash,.....40 grains.
Tincture of Myrrh,.....15 drops.
Elixir Calisaya,.....2 ounces.

Mix and take a teaspoonful in a wineglass of water every four hours, and use as a mouth wash, full strength or diluted.

Another preparation which is very beneficial is the following:—

Thymol,.....10 grains.
Borax,.....15 grains.
Water,.....2 ounces.

Mix and put a teaspoonful in a tumblerful of water. Use as a mouth wash and gargle frequently. After the attack subsides, tonics and a carefully regulated diet may be necessary for some time.

CANKER OR FOLLICULAR OR APHTHOUS STOMATITIS.

An inflammation of the follicles in the mucous membrane of the mouth and tongue, small vesicles appearing here and there, and, as the disease advances, running together forming blister-like patches which break and ulcerate. The disease is common in infants and young children.

Causes.—It is due to teething, indigestion, and the fermentation of milk in the mouths of nursing babies. It also occurs in the course of fevers, such as measles, etc.

Symptoms.—Redness and small, blister-like eruption on the edges of the tongue and the mucous membrane of the cheeks and inside of the lips. When these blisters rupture small gray ulcers remain, the flow of saliva is increased, the breath is foul, there is some fever and disinclination for food,—not so much due to loss of appetite as to the fact that nursing or chewing of food is painful to the irritated membrane. Digestion is impaired and there may be diarrhœa.

Treatment.—Clean out the bowels with a dose of magnesia and rhubarb. A solution of ten grains of the sulphate of copper in about three teaspoonfuls of water, to which four teaspoonfuls of borax must be added, may be applied to the ulcers once or twice daily by means of a strong camel's-hair pencil. Solid food, especially salted meats and fish, must be rigidly avoided during this complaint.

The following as a mouth wash is excellent:—

Peroxide of Hydrogen,.....1 ounce.
Formaldehyde (medicinal),.....5 drops.
Distilled Water,.....to make 3 ounces.

Mix and use as a mouth wash three or four times daily.

Or:—

Dobell's Solution, which is made as follows:—

Sodium Bicarbonate (Baking Soda),.....1 dram.
Carbolic Acid,.....30 grains.
Glycerine,.....1 ounce.
Distilled or Boiled Water,.....2 pints.

Mix and use as a mouth wash frequently.

If the condition is persistent, quinine sulphate, one-half to one grain three times daily, should be administered.

PUTRID SORE MOUTH OR ULCERATIVE STOMATITIS.

An inflammation of the mucous membrane and tissues beneath it in the mouths of children, beginning on the gums and extending to the lips, cheeks, and tongue.

Causes.—It is caused by unsanitary surroundings and poor food, occurring most frequently when the child is cutting teeth.

Symptoms.—The mucous membrane of the gums becomes swollen, boggy, and bleeds readily. White or gray patches appear on them. These patches slough off leaving raw ulcers with swollen margins. The condition may extend to the lips, cheeks, and tongue, although the tongue seldom ulcerates. The mouth is hot and a secretion, a mixture of saliva, blood, and broken down tissue, dribbles from the mouth. There is an enlargement of the glands beneath the angle of the jaw and the teeth may loosen. There is fever, foul breath, disturbance of digestion, and diarrhœa. The condition is usually of a week's duration, the ulcerated surfaces healing rapidly.

Treatment.—Administer an elixir,—iron, quinine, and strychnia,—one teaspoonful three times daily after meals, for general tonic effect, and

Formaldehyde (medicinal),.....20 drops.
Camphor Water,.....6 ounces.

Mix. Use as a mouth wash and swab ulcerated spots with a brush or absorbent cotton soaked in this solution.

Or the following powder may be applied to the ulcers:—

Salicylic Acid,.....20 grains.
Boric Acid,.....1 dram.
Bismuth Sub-Carbonate,.....2 drams.

Apply to the ulcers twice a day with a camel's-hair brush.

SOOR, MUGUET, SPRUE, WHITE MOUTH, THRUSH, OR PARASITIC STOMATITIS.

Causes.—A disease due to filth and uncleanliness, affecting adults but principally bottle-fed children. It may develop from a catarrhal

stomatitis (catarrh of the mouth), and is caused by the development of the thrush fungus. It affects adults suffering from cancer or consumption. In children it is contracted through the bottle, breast, or nipple.

Symptoms.—It begins first upon the tongue, which is dark red with whitish points or points that resemble milk curds. These points run together forming large patches in which the fungus develops. The patches may spread to the lips, cheeks, roof of the mouth, sometimes the tonsil and other parts of the throat. The breath is foul and feverish. Diarrhœa is sometimes present, the discharges being greenish yellow.

Treatment.—Strict cleanliness of the mouth and the application of borax to the patches, followed at once by a spray or mouth wash of peroxide of hydrogen. This causes considerable froth, which is destructive to the fungous growth. These applications should be repeated four or five times daily.

Or:—

Zinc Sulphate,.....5 grains.
Rose Water,.....2 ounces.

Mix. Apply locally and frequently on a cotton swab or with a camel's-hair brush.

Or:—

Tincture of Iodine,.....30 drops.
Glycerine,.....3½ drams.

Mix. Apply once daily.

In adults:—

Chlorate of Potash,.....30 grains.
Tincture of Myrrh,.....20 drops.
Elixir Calisaya,.....to make 3 ounces.

Mix. Take one teaspoonful in a wineglass of water every three hours, and apply the following locally to the ulcers three or four times daily:—

Salicylic Acid,.....10 grains.
Boracic Acid,.....30 grains.
Glycerine,.....2 drams.
Water,.....to make 2 ounces.

Mix.

INFLAMMATION OF THE TONSILS OR TONSILITIS.

For causes and symptoms, see page 336.

Treatment.—The patient should be isolated and precautions against

infection taken; this is necessary as there is so often possibility of a mistaken diagnosis in all cases of "sore throat" attended by ulceration. There is no certainty that such diseases are not diphtheritic. Indeed, the only sure knowledge is to be obtained by microscopic analysis, and the finding of the diphtheritic bacilli.

As very young children are unable to gargle, the treatment will consist in making the patient as comfortable as possible and to use some local treatment. The disease is self-limited and the prognosis is nearly always favorable in children unless other complications arise and they are to be met as they present themselves.

Older children, being able to gargle, may use a solution of:—

Boric Acid,.....1 teaspoonful.
Water,.....1 pint.

Gargle with this occasionally.

Much benefit often follows the painting of the tonsils with a ten per cent solution of nitrate of silver or with tincture of iodine carefully applied to the tonsils with a camel's-hair brush.

Where there is a tendency to rheumatism with which tonsilitis seems to be in some way closely allied, children of seven years may use:—

Salicylate of Soda,.....4 grains.

Take one such powder every three hours for the first twenty-four hours; after that every six hours.

It is much better that drugs be not given to young infants. Warmth and protection may be afforded to their neck and throat by rubbing with camphorated oil and wrapping in cotton batting. Warm drinks are valuable in all cases and other ordinary means of inducing perspiration may be employed.

Another valuable gargle for those old enough to use it is:—

Peroxide of Hydrogen,.....1 ounce.
Limewater,.....1 ounce.

To be used as a gargle every two hours.

Permanent enlargement of the tonsils is very common among children over two years of age. It is the cause of mouth breathing, snoring, and of talking through the nose. These are in a measure the symptoms of adenoid growths as well; and the two diseases often are present at once. The tonsils are frequently so large as to be easily felt from the outside of the throat. Difficulty in swallowing food is also a common symptom. As the eustachian tubes open into the throat

near the tonsils, this enlargement is often a cause of deafness, and the inflammation and irritation which the enlargement causes are sometimes the causes of ear trouble. The large size of the tonsils not only renders the patient susceptible to frequent attacks of tonsilitis but to diphtheria as well.

Treatment.—The removal of the tonsils by surgical means is the most favored treatment. The operation is not a serious one and is not attended by much pain or hemorrhage. After the operation liquid food is to be taken and a few days' protection from exposure observed. Very often it is found convenient to perform the operation for the removal of the tonsils (tonsilotomy) and that for the removal of adenoid growths at the same time.

QUINSY OR PERITONSILAR ABSCESS.

For causes and symptoms, see page 338.

This is a form of tonsilitis in which suppuration occurs with either spontaneous bursting of the abscess or release of the accumulated matter through surgical intervention.

Treatment.—There is always the possibility of aborting the attack when the disease is recognized in time. This can sometimes be done by giving:—

Salol,.....2 grains.
Dover's Powder,.....¼ grain.

This is to be given to a child of five years every two hours.

In the earlier stages, before suppuration occurs, cold applications bring relief; after suppuration, hot applications are to be employed. The inflammation and pain in the throat may be relieved by giving small pieces of ice and by applying the ice bag to the throat. When hot applications are needed, water as hot as can be borne is to be used as a gargle and hot flaxseed poultices applied externally. In small children it is necessary to be very watchful about the time of spontaneous bursting of the abscess as the contents of it may cause choking, and, possibly, result in suffocation.

The ragged edges of the tonsils leave hollow lodging places for particles of food and these, by their accumulation and decay, increase the risk of contagion from other diseases. It is therefore necessary to see that the tonsils are kept as clean as possible during and after the attack.

VOMITING.

Not so much a disease in itself as an indication of other forms of disease; a very important symptom.

Causes.—One of the most frequent and least alarming forms of vomiting is that caused by overfeeding. This is Nature's way of announcing that more food has been taken into the stomach than it can accommodate. In this connection it is well to remember that the child's stomach is very much smaller than most people are aware of. At birth the average capacity of the stomach is one ounce, or about two tablespoonfuls; at two weeks old, two ounces; at three months, four and one-half ounces; at six months, six ounces; at one year, nine ounces; and at eighteen months, twelve ounces. Where more food has been given than the stomach can hold it is only natural that the excess should be returned. The child empties its stomach with much greater ease than does an adult.

Vomiting is always a symptom of acute stomach indigestion; and nearly always of acute obstruction of the intestines. It is a usual symptom of peritonitis, brain diseases, the infectious diseases, and of worms.

Symptoms.—Vomiting from overfeeding occurs almost immediately after feeding, and is simply the act of emptying the overfull stomach. It is not to be regarded as a sign of illness.

Vomiting as a result of indigestion does not occur for some time after eating. Undigested food is always present in the matter so expelled.

In intestinal obstruction, the matter may contain digested food, bile, or, after some days, fecal matter.

In brain diseases the vomiting is forcible, the matter being suddenly and violently expelled.

Vomiting after a fall or a blow upon the head is a sign that some more or less severe concussion of the brain has occurred.

Vomiting attending whooping cough is largely mechanical and the result of the violence of the spasm.

Treatment.—This is to be adapted to the cause of the vomiting.

In overfeeding all that is necessary will be the lessening of the amount of food given at a time.

If the stomach is sour, repeated doses of limewater will be found serviceable.

If vomiting is caused by improper food, a little warm water will facilitate the expulsion of the offending matter.

If, after the stomach has been emptied, the vomiting does not cease, a few drops of spirits of camphor in a small quantity of milk will generally prevent its recurrence.

COLIC.

A severe griping pain in the bowels, which often occurs and with great severity during the first five or six months of infancy.

Causes.—Among the most frequent causes are overloading the delicate stomach with artificial food; bad milk; the influence of cold; and a reflex action from teething. It is a sign of intestinal disturbance and may be regarded as an indication of some form of indigestion.

Symptoms.—In slight attacks the infant suddenly becomes fretful, draws up its legs towards the abdomen, whines or cries for a few moments, and then resumes its usual quiet condition. After a very short interval, another attack of the same kind occurs, and again soon subsides; and this goes on until relief ensues. In many cases, however, the symptoms are much more violent: there is excessive and unappeasable screaming, violent kicking, flushing of the face, writhing of the body, and a distended and tense state of the abdomen.

Treatment.—When there is reason for believing that the breast milk is unwholesome, a change of diet is necessary. Using a mixture of cow's milk and water, or a prepared artificial food, may be tried. If the bowels are clogged, magnesia is a good remedy; it is anti-acid and purgative. Use three grains of magnesia with two grains of powdered valerian. Give twice a day until the acidity of the stomach is removed. If this does not keep up a sufficient action of the bowels, the proportion of magnesia should be occasionally increased, or a few grains of rhubarb added to the powders.

For lessening the violence and duration of the attacks, the following mixture is recommended: Dissolve one dram of camphor in an ounce of sulphuric ether; take thirty drops of this solution, twenty grains of magnesia, and six drops of laudanum, and mix them together with an ounce of fennel seed tea. Of this mixture, a teaspoonful may be given to an infant from two to six weeks old; and, if sufficient relief be not obtained in half an hour, about half a teaspoonful more should be administered. Gentle friction with dry flannel over the abdomen is useful in aiding the expulsion of the confined wind.

Frequently relief is obtained promptly by a rectal injection of one or two teaspoonfuls of glycerine in from two to four ounces of cold water.

The hot water bottle should be placed at the feet and hot applications over the abdomen. These should be of a high temperature but so placed and protected as not to injure the child. A teaspoonful of hot water with or without the addition of a few drops of peppermint, anise, gin, brandy, or asafœtida, will prove very comforting and relieve the pain. Hot catnip tea, or soda-mint tablets dissolved in hot water, are safe and useful temporary means of relieving pain. But no treatment is of permanent benefit unless directed towards the cause.

We must here caution mothers and nurses against the common but pernicious practice of administering large doses of anodynes or carminatives to infants. The habitual use of such substances almost always leads to very unfavorable consequences. Under this treatment the appetite and digestive powers fail; the body becomes emaciated, and the skin sallow and shriveled; the countenance acquires an expression of languor and suffering; and a general state of apathy, inactivity, and indolence ensues, which will probably terminate in convulsions, dropsy of the head, glandular swellings, incurable jaundice, or fatal exhaustion of the vital energies. All the usual soothing mixtures contain more or less opium, and innumerable infants have been irretrievably injured by their employment.

CRAMP IN THE STOMACH OR GASTRALGIA.

A form of neuralgia which occasions violent pains in the stomach.

Causes.—The effects of cold, either through exposure, wet feet, drinking ice water, and similar causes. It is also a forerunner of acute stomach indigestion caused by indiscretions in eating.

Symptoms.—The symptoms vary from intermittent pain in the stomach with no other symptoms, to severe pains which cause prostration, cold perspiration, faintness, and marked paleness.

Treatment.—Put the child to bed and apply a mustard paste or a turpentine stupe over the stomach to produce counter-irritation (see page 236). Hot drinks may be given consisting of brandy, gin, with hot water, and the addition of five drops of spirits of chloroform. If the feet are cold apply hot water bottles. No food should be given until the pain is entirely relieved; after which simple and easily digestible food only is to be given.

ACUTE STOMACH INDIGESTION.

Causes.—Improper food, which either exacts more work from the stomach than it is capable of performing, or is unfit by reason of an

impaired condition of the stomach. In young children who are fed on modified cow's milk the chances are very great that the milk is not sufficiently diluted and is too rich in proteids. Very often the disease attends weaning when the new food has been given either too suddenly or in a strength beyond the child's powers to digest. The sudden change from a liquid to a solid diet is another fruitful cause. In older children the condition is brought about by overloading the stomach or from eating heartily of food which "does not agree with it."

Symptoms.—The food remains for a long period in the stomach in an undigested state and induces an irritated condition which is relieved by vomiting. The hour after the meal at which the vomiting occurs and the degree of digestion that the food has reached in the length of time it has been in the stomach, is a clue to the condition of the stomach and the severity of the attack. There are always fever and high pulse with prostration, which may be very severe in the case of young children. The tongue is coated, and very often the stomach is filled with accumulated gas which causes distention. The appetite is either very poor or entirely gone.

Prognosis.—This is very favorable, except in the case of very young and delicate children, where it so often results fatally.

With care and rest the disease usually passes off in a few days.

Treatment.—The food which is the cause of the irritation must be at once removed. This is done in the case of very young children by washing out the stomach, or by giving the child a quantity of luke-warm water to drink from its bottle. This latter acts as an emetic. Older children may be given an emetic of mustard and water or similar simple means of emptying the stomach. After the stomach has been emptied the great thing is rest and quietness. No food should be given for four hours. Then the greatest care must be exercised in the choice of food. For the next twenty-four hours only barley water in very small portions is to be given; then beef juice and broth. After three or four days milk may be tried, but it must be very much diluted or, better, peptonized. There is very great danger in beginning the use of hearty food or of large quantities of food too soon. Even a nursing child must return to the breast very gradually and carefully. In such cases withhold the breast entirely for twenty-four hours, during which time the child takes very small portions of weak barley water. Then the child is placed at the breast for only two minutes every three hours. After a time the length of nursing is extended very gradually to three, four, and five minutes, and lengthened as improvement is seen.

If this condition is neglected the case will probably run into one of acute inflammation of the stomach, or that in turn to chronic inflammation. They differ only in degree and in the difficulty of managing the diet so as to restore the condition of the stomach.

DIARRHOEA.

Diarrhœa is more common during infancy than at any other period of life; and it is more likely to assume an unmanageable and dangerous character at this time than at a more advanced stage of childhood or in adult life.

Causes.—The exciting causes of this disease are extremely various. Irritating, crude, and inappropriate articles of food and drink are a frequent cause of diarrhœa. Children who are entirely nourished at the breast are much less liable to this complaint than are those nourished by artificial food. Some infants are invariably purged when fed on cow's milk, even when considerably diluted with water. Infants who are fed with solid food are still less likely to escape suffering more or less diarrhœa. The practice of allowing a child to eat potatoes, meat, pastry, dried fruit, and similar food is particularly injurious, and often produces chronic diarrhœa. Intense summer heat is often an important factor in producing this complaint, and the occurrence of bowel complaints among children is much more frequent during the hot season than at any other time of the year.

Treatment.—Give a purgative dose of castor oil, laxol, or syrup of rhubarb, or a powder containing:—

Calomel, ...1-10 grain.
Bicarbonate of Soda,.....1 grain.

Give one such powder every half hour until the child has taken eight or ten. Three hours after taking the last powder give a teaspoonful of castor oil.

Usually this treatment will suffice to arrest the diarrhœa. It is advisable to withhold all food except albumin water, barley or rice water, whey, mineral water, or cold boiled water for the first twenty-four or thirty-six hours. To prevent return of the diarrhœa nourish carefully and change the food if necessary.

If the diarrhœa has existed for some time this bowel cleansing treatment may not be required, but the following may be used:—

Dover's Powder,.....½ to 1 grain.
Subnitrate of Bismuth,.....5 grains.

Give one such powder every three or four hours.

Rotch recommends the following combinations:—

Subnitrate of Bismuth,.....2 drams.
Salol,.....16 grains.
Cinnamon Water,.....1 ounce.
Water,.....to make 2 ounces.

Mix, shake well, and give a teaspoonful in water every two hours.

Or, when the stools are green in infantile diarrhœa:—

Calomel,..... .1 grain.
Ipecac Powder,.....1 grain.
Milk Sugar,.....20 grains.

Mix and divide into ten powders and give one powder three times a day.

The following is highly recommended:—

Tannalbin,.....2 drams.
Brandy,.....2 drams.
Simple Syrup,.....4 drams.
Water.....to make 2 ounces.

Give a tablespoonful four to six times a day.

In the summer diarrhœas of children where there is vomiting and the causes are heat and improper feeding, give the following after the purgative doses first mentioned have operated:—

Calomel,.....1 grain.
Phosphate of Soda,.....30 grains.
Ipecac Powder,.....½ grain.
Milk Sugar,.....20 grains.

Mix and divide into ten powders and give one every half hour.

If the child is much prostrated give five or ten drops of brandy frequently. The fever is to be controlled by sponging the body with tepid water and alcohol.

Castor oil is best administered in doses of one dram in hot milk. An enema of warm water for a child of six months should consist of one pint. It is often more convenient than a purging dose.

SUMMER COMPLAINT OR CHOLERA INFANTUM.

An acute disease occurring among infants and young children during the hot weather of summer.

Causes.—A micro-organism usually conveyed in milk; faulty nutrition of the child; sour milk; fermenting food; teething; and cold. It is most common between the ages of three months and two years.

Symptoms.—It usually begins with vomiting and purging about the same time. The tongue in most cases is slightly furred at the beginning of the disease; but, after a few days, it becomes dry and brown. The stools are commonly fluid, intermixed with little spots of green bile; or they are as transparent as water; or are of the "rice-water" appearance. The patient is immediately prostrate, and emaciates very rapidly. The vomiting and purging are not always constant, but sometimes occur in paroxysms at intervals of five or six hours. In some fortunate cases they subside entirely after a duration of five or six hours. There is evident pain or great uneasiness in the bowels and stomach. The hands and feet are cold, the skin of the body and head is hot and dry, and becomes shriveled. In this condition the child lies upon the lap or upon the pillow, apparently exhausted and indisposed to move, except when impelled to vomit or to cry for water,—the only thing which it is willing to take,—and this is often thrown up instantly from the stomach or suddenly passed off by the bowels. The eyes lose their luster, the eyelids but half cover them, the nose becomes pointed, the skin contracted upon it, while the lips are thin and shriveled.

Prognosis.—The disease runs a short, acute course. Exhaustion is very pronounced. Convulsions and death may take place in from a few hours to two or three days. Complications, such as inflammation of the kidneys, pneumonia, etc., frequently follow the attack. Convalescence is slow and relapses are quite common.

Treatment.—On the first appearance of the disease, if possible, take the child to the open air of a farm or small village. A well ventilated apartment in the upper story of a house, if not too much heated by the roof, will give a child a much better chance for life than the ground floor.

The house should be clean and well aired; as a preventive of this disease children should be well washed daily with tepid or cool water, their dress is to be changed sufficiently often to insure cleanliness; nursing mothers are to abstain from eating unripe or unwholesome food, and children must be prevented from having it. The child should wear flannel next to its skin and worsted stockings on its feet even in the summer season; and when it has passed beyond its first year, the diet is to be strictly regulated upon the principles laid down elsewhere.

At the onset of the disease give calomel in one-fourth of a grain dose every hour for eight or ten doses, or until bile appears in the stools. Then give a dose of castor oil of one teaspoonful in hot milk.

Keep up the body heat by the use of hot water bottles, mustard baths, two or three times a day. Stimulate and quench the thirst with ten drops of brandy given in rice water or barley water every hour or two. At the same time give an enema of a teaspoonful of table salt in a pint of warm water to wash out the bowels.

To control the vomiting, to stop fermentation, and to arrest the movement of the bowels give:—

Subnitrate of Bismuth,.....2 drams.
Carbolic Acid,.....1 grain.
Syrup of Ginger,.....4 drams.
Peppermint Water,.....to make 2 ounces.

Give a teaspoonful every one or two hours.

Or:—

Tannalbin,.....80 grains.
Powdered Opium,.....1 grain.
Aromatic Powder,.....2 grains.
Milk Sugar,.....20 grains.

Divide into twenty-four powders and to a six months old child give one every four or six hours.

A child one year old will take two powders at a time every four or six hours.

Grease the skin over the stomach and bowels with vaseline or oil and then apply cloths wrung out of hot water and sprinkled with turpentine.

Or apply mustard pastes over the stomach and bowels.

CROUP.

Inflammation of the larynx and trachea, characterized by difficult breathing and a rough, hoarse cough sounding as if air was passing through a metallic tube. It usually attacks children of from one to three years of age.

Symptoms.—The symptoms are at first those of a common cold, or catarrh; then comes a dry cough, with hoarseness and wheezing; at night there is restlessness, and rattling is heard in the throat; after which the croupy crow and sound above spoken of give unmistakable warning of the disease. The child, after tossing about restlessly, starts up with a flushed face, and a distressing look of terror and anxiety; there is a quick pulse, and agitation of the whole frame, which soon becomes covered with a profuse perspiration. As the struggle for

breath proceeds, there is clutching at the throat, as though to force a passage; the arms are thrown wildly about, the respiration becomes more labored, the rough cough more frequent and characteristic. There is expectoration of viscid matter; strangulation threatens; and eventually the child falls into the sleep of exhaustion. It will wake up probably refreshed, and during the day may appear to be pretty well; but at night there will be a recurrence of the attack with aggravated symptoms, convulsions, and spasms of the glottis. The face is of a pale leaden hue; a film comes over the eyes; the pulse is feeble; the powers of life at length succumb and the patient sinks into a drowsy stupor, which ends in death. Such is the frequent course of this painful disease, and the changes from bad to worse are so rapid that there is little time for the operation of remedies.

Treatment.—Confinement to the house when croup threatens is always advisable, unless the weather be open and warm. Apply mustard pastes to the throat. Fill the room with the vapor of boiling water,—a large kettle on the stove will effect this,—or the vapor from slaked, freshly burned lime. A physician should in all cases be summoned immediately. Most cases of croup are really cases of laryngeal diphtheria and only a very small percentage is due to causes other than diphtheritic infection. If the condition prove to be diphtheritic there is the greater need of a physician. In true croup, not diphtheritic, while awaiting the arrival of the physician give a teaspoonful of the syrup of ipecac every ten or fifteen minutes until vomiting is induced. Free vomiting relieves the spasms but does not prevent a recurrence of them. Wine of ipecac, in 20-drop doses every ten minutes, will also produce the same effect.

Or:—

Turpeth Mineral,.....2 grains.

This dose for children two years old is to be repeated in twenty minutes or until vomiting occurs.

Should the child appear likely to sink from exhaustion, after vomiting has been brought about, stop the emetics and give:—

Solution of Acetate of Ammonia,.....20 drops.

Or, give twenty drops of brandy, or of camphor mixture.

It is said that the formation of the membrane may be stopped by:—

Sulphate of Quinine,.....1 grain.
Calomel,.....1-10 grain.

Give one such dose three or four times a day.

WORMS.

Worms are parasites which infest the intestinal canal of children principally.

Symptoms.—Fetid breath, grinding of the teeth during sleep, picking the nose, paleness of the face, irritableness, and itching of the lower parts of the body.

Round or Stomach Worm.—The best remedy is santonin; the usual method is to give it in a powder combined with the same amount of calomel, and a little pulverized sugar added. One grain of santonin and one of calomel would be sufficient for a child three years old.

One-sixteenth to one-fourth of a grain of podophyllin may be substituted for the calomel, given in syrup or molasses, or the santonin given alone can be followed with a dose of oil; there is no better method of expelling stomach worms. Santonin colors the urine, and may produce nervous symptoms, hence give only one powder each night and morning for two days, follow with a mild purge if needed, wait two days, and administer again in the same way.

Tape Worm, least common of the usual varieties, is the most troublesome and difficult to remove on account of a strong hold by little hooks upon the mucous coat of the intestines. Before giving medicine to expel a tapeworm, preparatory treatment should be used as follows: The diet should be light for two days, and the bowels cleansed of mucus by physic. Medicine to remove the entire worm must be efficient. The following harmless treatment can be used: After a day or two of fasting, take two ounces of pumpkin seed, remove the outside husks, beat fine, add a little sugar and water, and drink the whole at once. One hour and a half later take an ounce of castor oil. The following, though not as simple, is efficient:—

Croton oil,.....1 drop.
Chloroform,.....1 dram.
Glycerine,.....1 ounce.

Mix thoroughly. Take in the morning, omitting food; this acts promptly.

Thread or Seat Worm.—Proceed precisely as for round worms, which will remove them, but as they multiply from eggs deposited in the folds about the rectal orifice, it is necessary to inject a decoction of quassia, or apply carbolized vaseline, for several nights, to prevent their further multiplication; the strength of the carbolic salve is:—

Carbolic Acid,.....15 grains.
Vaseline,.....1 ounce.

Mix thoroughly and apply faithfully.

SPASM OF THE GLOTTIS OR CHILD CROWING.

This exhibits much the same symptoms as croup. It is not, however, of an inflammatory character, but is commonly symptomatic of some other disease coming on, as a result of irritation caused by hydrocephalus, teething, worms, etc. The medical man only can judge of the probable cause, and he will use such remedies as are most applicable to the peculiarity of each case.

Treatment.—The following mode of treatment is recommended: A sponge about the size of a large fist, dipped in hot water, squeezed half dry, and applied instantly under the little sufferer's chin over the larynx and windpipe; a second sponge, heated in the same way, should be used alternately with the first. A perseverance in this plan during ten to twenty minutes produces a vivid redness over the whole front of the throat, just as if a strong sinapism had been applied. In the meantime the whole system feels the influence of the treatment; a warm perspiration breaks out, which should be well encouraged by warm drinks, and a notable diminution takes place in the frequency and time of the cough, while the hoarseness almost disappears, and the rough, ringing sound of the voice subsides, along with the difficulty of breathing and restlessness; in short, all danger is over, and the little patient again falls asleep, and awakes in the morning without any appearance of having suffered from so dangerous an attack. This disease has been repeatedly treated on this plan, and with the most uniform success. It is, however, only applicable to the very onset of the disease; but it has the advantage of being simple, efficient, and easily put in practice, and its effects are not productive of the least injury to the constitution.

SNUFFLES OR COLD IN THE HEAD.

Children are very liable to this distressing complaint, caused by inflammation of the lining of the nose.

Treatment.—Rubbing the nose with camphorated oil, goose grease, lard, or tallow will generally give relief. Keep the bowels open with a little castor oil; and, if the stoppage in the nose is obstinate, give warm doses of catnip, pennyroyal, or balm tea.

CONVULSIONS, FITS, AND SPASMS.

These are the result of some form of irritation acting upon the brain and nervous system.

Treatment.—Domestic treatment should never be trusted in such cases. Not a moment should be lost in sending for a physician.

If anything can be done in the meantime, it is, to evacuate the bowels by warm water injection, made more active by the addition of castile soap and a pinch of salt, and to administer the warm mustard bath. An important point, never to be forgotten in the hurry of these cases, is to preserve the stools for inspection, otherwise the physician will be deprived of a very important source of judgment.

In cases of fits arising plainly from exhaustion, there need be no hesitation in giving five drops of sal volatile in water. It is necessary to maintain self-possession.

In all cases, clear the bowels by means of the slow injection of from a quarter to half a pint of warm soapsuds.

INFECTIOUS DISEASES OF CHILDREN.

CEREBRO-SPINAL FEVER OR CEREBRO-SPINAL MENINGITIS.

A malignant epidemic fever.

Causes.—A micro-organism, *the Diplococcus intracellularis,* which is supposed to affect the brain by entrance through the nose. Bad hygiene; exposure; winter season; and youth are the chief predisposing causes. It affects populations in cities almost entirely, where it appears at long intervals in the form of an epidemic; then it disappears mysteriously and little is known of it for some years.

Symptoms.—Chill; intense headache; dizziness; vomiting; and great weakness. Very early the muscles of the neck become set and the head is drawn back; the muscles of the back are similarly affected and the body is bent or arched back. Cramps; convulsions; delirium; inflammation of the joints; extreme sensitiveness to light and sound; then follow deafness; blindness; loss of the special senses; paralysis of the muscles of the eye; there is also great emaciation. Drawing the nail across the abdomen leaves a red streak characteristic of affections of the brain. This condition lasts for from a few hours to several weeks. The usual crisis of the disease is reached in from three

to eight days; it is followed either by death or a long and tedious convalescence.

Prognosis.—The mortality reaches from 20 to 75 per cent. On recovery there may be constant headache; gastric disturbance; blindness; deafness; mental feebleness; epilepsy; and palsy.

Treatment.—The chief means of relief are afforded by puncture in the lumbar region of the back to withdraw one or two ounces of the fluid early in the attack. This relieves the coma and insensibility, and doubtless saves many cases. The other treatment is of the symptoms as they occur and to support the strength and resistance of the patient. A liquid diet of as nourishing food as possible is given. When this cannot be taken or retained, it must be administered by rectal feeding. (See page 250.) Pain, delirium, convulsions, and sleeplessness are relieved by the use of narcotics. A weak, rapid, and irregular pulse indicates the necessity of stimulants to prevent collapse. Bedsores are common. (For their prevention and management, see page 228.)

WHOOPING COUGH OR PERTUSSIS.

A contagious disease, marked by a paroxysmal cough, most largely affecting young children.

Cause.—A micro-organism communicated by mere proximity and even in the open air. It is the most contagious disease to which young infants may be exposed. Fully one-half the cases are among children less than two years of age.

Symptoms.—Three stages are recognized: the catarrhal, the spasmodic, and the period of decline.

During the catarrhal stage there are symptoms of ordinary bronchitis: the watery eye; running at the nose; and some slight fever. This usually lasts for eight or ten days. Towards the latter part of this period the cough increases in intensity and there may be three or more daily attacks before the "whoop" is heard.

The spasmodic stage begins with the peculiar cough from which the disease takes its name. That is the first confirming symptom of the disease. Up to that time the nature of the disease may not be suspected. The child may give a few short coughs, ending with the "whoop," and the expulsion of thick, stringy mucus, and sometimes with vomiting. During a paroxysm the face is swollen and red, becoming purple; the eyes protrude; nosebleed is quite common; the spasm may last for two or three minutes, during which half a dozen "whoops" may occur.

When the spasm comes just after a meal and is accompanied by vomiting, the child may suffer from lack of nutrition. After an attack the child can barely stand; perspiration is profuse; and the child appears dazed. The sensation of suffocation causes intense suffering; artificial respiration is sometimes necessary to relieve infants from impending asphyxia. The number of spasms which occur in twenty-four hours varies from six to fifty. They are always more frequent at night than in the daytime; and in a close room, than in the open air. This stage runs on an average about one month. There are cases of such mildness that it may continue for only a week; others again, in winter, often last for three months.

The third stage, or period of decline of the symptoms, is marked by a gradual decline of the severity of the symptoms; the "whoop" stops; and the cough grows more and more like that of ordinary bronchitis. Generally this lasts for about three weeks; but there is danger of a longer continuance of it during the winter, and the cough may be prolonged by habit, which is very strong in some children.

Prognosis.—During infancy and the first year there is, perhaps, no disease to be more dreaded; in this period of life there is such great danger of complications of pneumonia, diarrhœa, and convulsions. Two-thirds of the total number of deaths from whooping cough occur in the first two years of life. It is very rare that fatal cases are known after the fourth year. The paroxysm, while terrifying to parents, is very rarely the cause of death. A few such cases are known. One great danger that this disease shares with measles is the predisposing influence to consumption.

Treatment.—The great need, and in the majority of cases the only need, is care in the hygienic surroundings of the patient. Good nursing and watchfulness are important essentials. Protection against cold and abundance of fresh air will pull most of the cases through. The benefit of good air is seen in the fact that the paroxysms are fewer and occur at longer intervals with less severity while the patient is in the open air. In the case of very young children great caution must be exercised in outdoor treatment. Care must be taken with the food of young children, as there is danger of intestinal indigestion and other disturbances. When vomiting occurs, it will often be necessary to repeat a meal in order to properly nourish a child. Digestion disturbances increase the severity and the frequency of the spasms. Inhalations of eucalyptol or creosote are valuable. Dr. Holt advises the use of antipyrine in one grain hourly doses for a child of one year; for a

child two years old, two grains repeated every four or six hours. But antipyrine should not be used if pneumonia threatens.

A child of one year may take:—

Extract of Belladonna,	1 grain.
Alum,	½ dram.
Syrup of Ginger,	1 ounce.
Syrup of Acacia,	1 ounce.
Water,	1 ounce.

A teaspoonful every six hours.

The following treatment has proved of great value:—

Bromide of Sodium,	24 grains.
Antipyrine,	8 grains.
Syrup of Ipecac,	32 drops.
Water to make,	1 ounce.

One teaspoonful every two hours for three or four days to a child of two years. Then give instead three grains of sulphate of quinine every three hours for three or four days. Then return to the mixture of sodium bromide, antipyrine, and ipecac, every two hours for three or four days, and so on until the whooping cough subsides. In order to insure ample protection from draughts, there may be applied a snugly fitting jacket of cotton batting extending from the armpits to the hips and covered with oiled silk.

In cases of exposure of young children or delicate patients and risk of cold Dr. Hare recommends a bronchitis tent under which the child may rest day and night. It is made by fastening a sheet to four upright sticks placed one at each corner of the bed. Broomsticks or poles may be used in its construction, and it may be decorated to make it attractive to the patient. The steam from a teakettle kept constantly boiling at the foot of the bed may be led into the tent and the water may be medicated. This is very useful in rooms that are unevenly heated, with cold floors, or when dry furnace heat is used.

MUMPS OR PAROTIDITIS.

An acute, infectious inflammation of one or both of the parotid glands, with or without swelling of the salivary glands and the neighboring tissue.

Cause.—It is caused by a specific poison which can be communicated from one person to another by contact, or may be carried in clothing. It more commonly attacks males than females, and is most

common between the ages of five years and of puberty. One attack generally, but not always, renders a person immune.

Symptoms.—The chief symptom besides the swelling of the glands is pain in the parotid region, at the angles of the jaw. This pain is greatly increased on attempting to move the jaw. There is fever to a moderate degree; marked swelling of the side of the face. The swelling subsides in about one week, when there is recovery or, more frequently, an attack on the other side. The breasts of females and the testes of males are often involved in inflammation. Orchitis is the name applied to the latter condition.

Prognosis.—In mild cases the termination is always favorable; but with complications the disease is more serious.

Treatment.—Liquid diet is compulsory, owing to the difficulty of moving the jaw without pain and the inability to masticate solids. Sour foods and drinks increase the pain by exciting the flow of saliva. If the fever is high, 3-drop doses of tincture of aconite may be given. If pain is severe, hot fomentations may be applied. If the testicles are involved, aconite may be given with potassium citrate as follows:

Tincture of Aconite Root,.....1 to 3 drops.
Sweet Spirits of Niter,.....10 to 15 drops.
Solution of Potassium Citrate,....to make 1 dram.

Take one such dose every three hours.

The following is an effective liniment for application to the neck and throat; especially if the swelling suddenly disappears and the fever becomes high:—

Camphorated Spirits,.....1 ounce.
Solution of Subcarbonate of Ammonia,....2 drams.
Tincture of Cantharides,.....½ dram.

Continue to apply, rubbing well in, until the swelling reappears.

Ointments of belladonna, guaiacol, and mercury, either separately or in combination, may be applied with advantage.

SCARLET FEVER OR SCARLATINA.

Causes.—A micro-organism which, so far, has not been clearly defined. It is known to be of very great vitality, and the disease is communicated by the skin, which peels off in the process known as desquamation. The poison is conveyed into the body by the respiratory organs and by food. It principally attacks children under fifteen years of age. While second attacks are known they are uncommon.

Symptoms.—There is usually a scarlet rash on the second day of illness, accompanied by marked fever symptoms. The outbreak is sudden. There is a chill; vomiting or convulsions; fever of 105°, and pulse from 110 to 140 beats per minute. The rash is bright scarlet and soon spreads over the entire body. The eruption is level with the surface of the skin and disappears on pressure. After the rash has remained for a period of from five to seven days it disappears, and the process of desquamation or peeling of the skin begins. Sore throat then begins and is of an acute catarrhal inflammatory nature with swelling of the glands and tonsils. Swallowing is difficult; the tongue, at first furred, soon assumes the "strawberry tongue" characteristic of scarlet fever. The simple cases of the disease last for from three to thirteen days.

Prognosis.—But the danger is not then over; for, besides the complications of the disease period, there are many serious possibilities in this direction during the slow and tedious period of convalescence. The fatality is from five to thirty per cent, according to the severity of the disease and the presence of complications.

Treatment.—Isolation and strict enforcement of the preventive measures described on page 154. The bowels are to be opened by:—

Calomel,.....1-10 to ¼ grain.
Bicarbonate of Soda,.....1 grain.

Make ten such powders and take one every half hour, or until the bowels move freely.

The fever is to be reduced by cold bath, cold douche, cold sponging or cold pack, as detailed on page 256. At the same time the following fever mixture may be given with great benefit:—

Acetate of Potash,.....4 drams.
Sweet Spirits of Niter,.....1 ounce.
Water enough to make,.....4 ounces.

Give one teaspoonful, well diluted in water, every two or three hours.

Headache is relieved by application of the ice bag.

As soon as the rash appears the body should be anointed with cocoa butter, or cold cream, or:—

Eucalyptol, ...1 dram.
Carbolized Vaseline,.....1 ounce.

Mix and apply lightly. This is not only to allay the itching which occurs, but also to prevent the flying about of the particles of skin by which the disease is communicated.

Rest in bed and liquid diet are to be enjoined.

For sore throat use Dobell's solution as a spray.

A good gargle to be used every hour in such cases is:—

Thymol,	4 grains.
Glycerine,	1 ounce.
Water,	1 ounce.

Where the attack is malignant, stimulation is necessary.

Acute Bright's disease of the kidney (acute nephritis) is a common complication after the peeling has begun in the second and succeeding weeks.

Scarlatinal inflammation of the joints may be benefited by:—

Salicylate of Ammonia,	2 drams.
Simple Elixir,	½ ounce.
Simple Syrup,	1 ounce.
Compound Tincture of Cardamom,	½ ounce.

Take a teaspoonful in water four times a day.

In inflammation of the ear (otitis), syringe the ear with hot water or apply the hot water bottle.

MEASLES OR RUBEOLA.

Cause.—A micro-organism about which, as yet, little is definitely known. It is usually communicated by clothing and attacks children generally and occasionally adults. It generally occurs as an epidemic, although single cases are frequently met with. First attacks commonly render the subject immune.

Symptoms.—The first symptom is usually an attack of what appears to be a common cold in the head (coryza). A chill may or may not accompany it. Then comes fever of about 101° or 102°. Headache, soreness in the muscles, inflamed and watery eyes, great sensitiveness to light, coughing and sneezing quickly follow. The fever subsides on the second day, is absent on the third, and reappears on the fourth. Then appears a group of small, dark-red eruptions on the face and later over the entire body. Itching and burning attend the eruption, which begins to disappear about the ninth day. The spots go away in a sort of bran-like flaking of the skin.

Black measles is the name given to that form which is marked by very dark colored eruption due to the presence of a form of hemorrhage and in which the patient is prostrated. It is met with in jails, camps, and unsanitary dwellings.

Prognosis.—When not complicated the disease is not at all fatal. Attendant lung troubles make the case more serious. Black measles are more generally fatal.

Treatment.—Disinfection and preventive measures must be carefully observed as described on page 154. The patient must be isolated; put to rest in bed; the room must be comfortably warm, free from draughts, and well ventilated.

Keep the bowels open by the use of Hunyadi Janos water, Apenta water, Seidlitz powder before breakfast, or other mild laxative. The diet is semisolid as described on page 277. No medicine is needed in mild cases. If the fever is high it may be reduced by cold sponging, or alcohol rub, as on page 251. This fever mixture may be given:—

Tincture of Aconite Root,.....½ to 1 drop.
Sweet Spirits of Niter,.....10 to 15 drops.
Solution of Citrate of Potash to make,.....1 dram.

Take one such dose every two hours.

Itching is relieved as in scarlet fever (page 564.)

For the inflamed, catarrhal condition of the nose and throat the following is very good:—

Creosote,.....2 drams.
Oil of Eucalyptus,.....6 drams.

Put 30 drops of this in a pint of boiling water and let it vaporize over a lamp or stove, so that the patient may inhale it. In addition, one or two teaspoonfuls of Brown Mixture every two or three hours is beneficial.

For treatment of children the following may be used:—

Codeine Sulphate,.....2 grains.
Syrup of Ipecac,.....1 dram.
Syrup of Wild Cherry,.....1 ounce.
Camphor Water enough to make,.....3 ounces.

For children of four or five years, give ½ teaspoonful.

For children two to four years, give ¼ teaspoonful.

For children of six years or over, give 1 teaspoonful.

Let it be taken every two or three hours.

During convalescence give syrup of iodide of iron in from 10 to 30 drop doses in a little water three times a day. Cod-liver oil is also of great service.

GERMAN MEASLES OR RUBELLA.

Causes.—A micro-organism not yet well known. It is often an epidemic disease, although single cases frequently occur. The con-

tagion like that of measles is carried in clothing. It is most common in childhood and one attack generally renders the subject immune.

Symptoms.—The attack is sudden with a mild fever. The eyes are watery to a slight degree, but there is little or no cold in the head. The throat is sore and the glands of the neck swell. At any time from the first to the fourth day a rose-colored eruption of spots of pinhead size appears.

The disease usually lasts a week. Recovery is almost universal.

Treatment.—Generally no treatment is required. In aggravated cases, where any treatment may be thought necessary, that of measles is sufficient. (See "Measles," page 565.)

DIPHTHERIA OR PUTRID SORE THROAT.

Cause.—The micro-organism known as the Klebs-Loeffler bacillus or the *Bacillus diphtheriae*. This bacillus in its growth produces a poisonous material which is absorbed into the body and causes the disease. There is a great deal of confusion caused by the use of the word diphtheritic in naming diseases. It is not diphtheria unless the bacillus mentioned is present, no matter how closely the so-called disease may resemble diphtheria. Bad hygiene increases the severity of the attack and causes it to spread more extensively. It is eminently contagious and is carried by clothing, and the virus floats in the air to a considerable distance. It develops in from three to five days from the time of exposure.

Symptoms.—The form and severity of the symptoms vary considerably in different cases. An attack which ultimately proves to be very serious may come on with the mildest form of symptoms. There are chill; fever up to 105°; headache; listlessness; loss of appetite; stiff neck; pain in the angle of the jaw and in the ear; sore throat; aching limbs; difficulty in swallowing; prostration and weakness. The throat is usually the seat of the disease. There is an effort to clear the throat by hawking; there are redness and swelling in the throat; a dirty-white membrane forms on the sides and sometimes on the uvula; when this membrane is removed there shows a raw, bleeding surface upon which the membrane soon forms again; the tonsils are often spotted with the membrane; the breath becomes offensive and the glands of the neck swell. The nose is often affected by the discharge; and nosebleeding is frequent. When the disease affects the larynx there is hoarseness or loss of voice, a croupy cough, and difficulty in breathing. The disease lasts

from two days to a fortnight; complications may extend this time indefinitely and relapses must be watched for.

Complications and After-effects.—There may be eruptions on the skin, which, while not dangerous in themselves, may lead to a wrong diagnosis of the disease.

Inflammation of the kidneys (nephritis) with accompanying increase of albumin in the urine (albuminuria) is the most common complication.

Broncho-pneumonia is very common and one of the most dangerous. Inflammation of the lining membrane of the heart (endocarditis) and inflammation of the joints (arthritis) are often seen. The patients are often left in an anæmic condition. Paralysis as a result of the distribution of the poison of the bacillus through the system occurs in from 10 to 20 per cent of the cases. It appears in the muscles of the throat and renders swallowing difficult; it is also seen in a loss of feeling in the membranes of the throat; the eye muscles are sometimes paralyzed; the muscles of the face are also affected; and the hands and feet are in some cases paralyzed. Slow pulse (brachycardia) and fast pulse (tachycardia) and even cessation of the heart's action are very often noticed.

Prognosis.—A case of diphtheria, mild or severe, is always a matter of very great seriousness. About 10 per cent of the cases die; and the mortality is greater among children than among adults. A good constitution, retaining of strength and vitality, with a moderate fever are good indications. High fever, great swelling, affection of broad surfaces, the nose and larynx, bleeding from throat and nose, loss of strength, and complications are very serious indications.

Treatment.—Antitoxin in all cases, mild or severe. Not only the patient but all who are or have been exposed, are to be treated as soon as possible. This is for the physician to perform and direct. Antitoxin serum and treatment are fully explained elsewhere. Rest in bed, and a liquid diet (page 277), are absolutely necessary. If it is difficult for the patient to swallow, rectal feeding is to be resorted to (page 234). The atmosphere of the room is to be moistened by vapor and steam. (See page 341.) The strictest attention must be paid to disinfection and preventive measures throughout the entire course of the disease. (See page 155.)

Alcoholic stimulants may be used from the first very liberally. In the presence of the poison of the bacillus it seems that the patient can bear large quantities of stimulants, much more than in a state of health, without intoxication. The following is a useful medicine for internal use:—

Corrosive Chloride of Mercury,.....1-48 grain.
Tincture of Chloride of Iron,.....5 to 10 drops.
Glycerine, ...10 drops.
Water, ...1 dram.

Take one such dose every two hours in water.

Or:—

Tincture of Chloride of Iron,.....5 to 10 drops.
Chlorate of Potassium,.....3 to 5 grains.
Glycerine,.....½ dram.
Syrup of Ginger,.....1 to 2 drams.

Take one such dose in water every one or two hours.

The bowels should be kept open by:—

Calomel, ...1-6 grain.
Bicarbonate of Soda,.....1 grain.

Give one such powder every hour until the bowels move.

For cleanliness, the throat and nose are to be sprayed with peroxide of hydrogen and water, equal parts, every four hours in mild cases and every two hours in the daytime and every four hours at night in severe cases. Dobell's solution may be used with a spray or swab every two hours.

Another useful swab to be used every three hours is:—

Carbolic Acid,.....20 drops.
Tincture of Chloride of Iron,.....4 drams.
Glycerine, ...1 ounce.
Water, ...1 ounce.

An effective gargle to be used every three hours is:—

Chlorate of Potash,.....4 drams.
Carbolic Acid, ...2 to 4 drops.
Tincture of Myrrh,.....1 ounce.
Infusion of Cinchona,.....2 ounces.

Loffler's solution is a useful swabbing application.

A good nasal syringing preparation is:—

Sulphite of Soda,.....3 drams.
Glycerine, ...2 drams.
Water, ...4 ounces.

Administer by a syringe every two hours.

In the application of swabs and sprays to the throat and nose, it is not intended that the membrane should be removed. It is impossible to effectively remove it; the surface is left sore and bleeding and the membrane rapidly forms again. Since the introduction of the antitoxin

treatment there has been a great change in the use of these preparations. All that is intended is to prevent as far as possible the accumulation of the bacilli in these parts with the danger of their being inhaled and drawn down into the lungs and stomach.

The complications enumerated above must be watched and met as they occur by proper symptomatic treatment.

During the period of convalescence, there is need of good nourishment and stimulation, to restore the strength and to change the anæmic conditions. Massage and electricity will be needed if paralysis is present.

There is probably no disease that calls for good nursing and careful enforcement of the means of preventing the spread of the disease as does diphtheria.

CHICKEN-POX OR VARICELLA.

An acute, infectious disease usually occurring in children under ten years of age.

Cause.—It is caused by a micro-organism which has not yet been wholly isolated.

Symptoms.—It appears in from ten to fifteen days from the time of exposure to the contagion. There are moderate fever; thirst; constipation; and vomiting. The fever runs from 103° to 104°. In about twenty-four hours the eruption appears in the form of red spots which soon fill with a clear or slightly turbid liquid (serum). They have no red band around them nor are they hard. They appear in waves or crops. They are accompanied by intense itching. This leads the patient to scratch or pick the pustules. The effect of this is to cause them to affect the skin tissues more deeply and to leave a scar or pock-mark. They dry up in about a week, the crusts dropping off and not generally leaving a pit unless aggravated as above stated.

Prognosis.—The disease practically always terminates favorably.

Treatment.—The disease is usually so mild that no treatment is necessary. Exposure to cold must be prevented, although it is not always necessary to keep the patient in bed. Careful nursing, and attention to diet and warmth, are usually all that are required. If the fever is high it may be reduced by giving a few drops of sweet spirits of niter in a teaspoonful of citrate of potash solution.

BOOK VII.

ACCIDENTS AND EMERGENCIES, POISONS AND THEIR ANTIDOTES.

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CARRYING INJURED PERSONS.

A door, a settee, or a shutter will make a good litter. Coats, shawls, or blankets will serve for pillows. In placing an injured person on the litter, do not place the litter beside the patient, but let the foot of the litter be at his head. In this position it is easy to gently lift the patient up without fear of stumbling. One of the assistants should devote his entire attention to the wounded part. Never let a stretcher be carried upon the shoulders of the bearers. It may, if necessary, be supported by straps. The bearers must not keep step while carrying a patient on a litter. When carrying him uphill, his head should go first; downhill, his feet.

If the patient can walk, let him be supported and assisted by placing his arms around the necks of two helpers. Sometimes a patient who cannot walk may be placed in a chair and easily carried. A support or "chair" made by the interlocked hands of the assistants is also a convenient mode of carrying one who is not obliged to lie down.

A form of interlocking three hands is good, as it leaves one arm free with which to support the patient's back.

One assistant may pass his arms under those of the sufferer and lock his fingers over the patient's chest, while a second takes the sufferer's legs, one over each arm. When any form of carrying other than a litter is used, the assistants should keep step.

If it is necessary to carry the patient upstairs to his room, care must be taken that the way is cleared as far as possible that those carrying him will have plenty of room.

Remove the clothing before putting him to bed. If an arm is injured, draw the sound arm from the coat, vest, or shirt first. If night clothing is put on him, put the injured arm in first. Remove the trousers by ripping the outside seam.

The patient may be lifted from the stretcher to the bed in one of two ways: first, place the stretcher at the foot of the bed, in line with it, and lift the patient bodily over the footboard; second, place the stretcher beside the bed, one helper between the stretcher and bed and three others

on the outer side. Three stoop down and receive the patient upon their knees, where they support him, while the fourth removes the stretcher and stands out of the way. The patient is then lifted upon the bed.

BANDAGES AND BANDAGING.

Any surgical wound-dressing should be absorbent, to admit of the ready impregnation with medicinal substances and to absorb discharges. The substances in most common use are absorbent cotton, gauze, lint, tow, oakum, jute, wood-wool, moss, peat, and pine sawdust.

Lint, in the form of "patent lint" is well adapted for wet dressings and for spread cerates; domestic lint is prepared from old linen, boiled in a weak alkaline solution, freed from this by washing, dried, and scraped on one side with a knife; this latter procedure may be dispensed with. Paper lint is moderately absorbent, and can be used with fair satisfaction for the application of wet dressings over unbroken surfaces. Absorbent gauze is ordinary cheese cloth from which all greasy material has been removed by boiling in a weak alkaline solution (e. g., washing soda or soft soap), thoroughly rinsing out in pure water and drying. It can readily be impregnated with any medicinal agent, and freely absorbs discharges. Tow, unless rendered aseptic, should be used only outside other dressings as an absorbent or to pad splints; the same remark is applicable to oakum, jute, and the substances now to be considered. Absorbent cotton, made by a process similar to that for preparing gauze, is an exceedingly useful material, readily rendered antiseptic by impregnating it with antiseptics in solution or in fine powder. It can also be used for wet dressings. Moss, long-fibered, such as abounds in the far South, cleansed and baked, is an excellent outside dressing, as is wood-wool, peat, or pine sawdust sewed up in bags of proper size. So far as possible, all the substances, even when made antiseptic by germicidal drugs, should be previously rendered aseptic by steam under pressure.

Practically speaking, gauze rendered sterile by steam in the modern pressure sterilizer, the antiseptic gauze prepared with corrosive sublimate or carbolic acid, the sterile or medicated cotton and the sublimated wood-wool, prepared in sheets, are the dressings chiefly used in this country.

For various mechanical purposes surgical dressings are used in the form of compresses, firm masses of different sizes and shapes, oblong, square, cylindrical, graduated, etc., made by folding up lint, muslin, or gauze. All of them should be sterilized. Graduated compresses

may be either pyramidal or wedge-shaped, and are also formed by superimposing one upon another, in proper relation, a series of square or oblong compresses of gradually diminishing size. A square of lint or muslin cut from the angles toward its center forms a Maltese cross well adapted for snugly applying a dressing over a projection, as a stump. Pledgets are compresses formed of cotton, tow, oakum, etc., in which the fibers are pulled longitudinally until most are parallel, the ends folded and tucked in, and then formed by pressure of the bands into various shapes. They are used externally to other dressings to absorb discharges or to exert compression. Tents are small cylinders or cones made by rolling strips of gauze or lint, or by twisting masses of oakum into the required shape; they are occasionally used to keep wounds open to permit serum or pus to escape. If wet dressings are employed, especially where warmth is desired, some covering impervious to heat and moisture must be used, such as "rubber dam" oiled silk, paper passed through melted wax or paraffin, or even stout paper thoroughly greased.

Roller bandages consist of strips of muslin, preferably unbleached, or gauze, varying from one inch to four inches in width and from one to twelve yards in length, which are rolled up from one end so as to form "single-headed" rollers, or are rolled from both ends, constituting "double-headed" rollers. Bandages are rolled either by the hand or with some kind of bandage roller. To roll by hand, fold one end for two or three inches several times upon itself, then, forming this portion into a small mass, roll the bandage upon the thigh until a small cylinder is formed. Next, seize this between the thumb and forefinger of the left hand, the unrolled portion firmly held between the extended right forefinger and thumb, keeping up moderate traction so as to tighten the cylinder, which is formed by first supinating (turning palm up) the left hand, then, loosening the grip, pronating (turning the back up) the same hand to gain a fresh hold, so that by supinating again the cylinder will be rolled around its long axis from right to left; this rotation is kept up by a series of movements of supination and pronation, the remaining fingers of the left hand aiding in the revolution of the cylinder, while the extended right forefinger and thumb revolve partly around the cylinder. A single-headed roller consists of an initial or free end, a terminal one—i. e., that in the center of the roll—and a body, the portion between the two extremities. In applying a single-headed roller, hold it between the thumb and fingers of one hand, pressing it firmly into the palm by the fingers, and always place the external surface of the free end on the part to be bandaged to prevent its sudden unrolling;

retain it there by pressure of the fingers of the other hand until it can be fixed by one or two circular turns. All bandages must lie smooth and flat, each edge exercising the same pressure, otherwise excoriation of the skin or interference with the circulation may result. The turns of a roller applied to a cylindrical part may pass in a circular manner, each turn exactly covering the preceding ones.

If the part be covered by causing the turns to ascend more or less rapidly in a spiral manner, each turn overlapping the preceding one about one-third, the result is a spiral bandage. In most limbs the attempt to cover with a spiral will result in only one edge of the bandage being in contact with the part, the other standing freely off. To obviate this, adopt the following manœuver: hold the spiral turn, just made, with the fingers of the left hand on the upper surface of the limb, then, with the roller held in the supinated right hand, four to eight inches being unwound so as to form a dependent loop, pronate the hand, carry the bandage loosely beneath the limb until the opposite side is reached, when, by gentle, gradual traction, the reversed turn will snugly apply itself to the part; this is called a "reversed turn" or "making a reverse" and, combined with the spiral turns, a "spiral reversed bandage." The secret of success is to make the loop of bandage turn over without the slightest traction, this being made only when the opposite side of the limb is reached.

When a projecting point is to be covered—the elbow, for instance—a series of "figure eight" turns, applied alternately above and below, will best secure this end, each overlapping its neighboring turn by one-third of its width. Such regions as the groin, axilla, shoulder, and breast can be best covered by what are essentially figure-of-eight turns, each succeeding one ascending from below upward, overlapping by one-third, forming a figure like "the leaves of an ear of corn," one member of the figure of eight encircling the thigh, for instance, the next the pelvis, the next the thigh and groin, and so on; this bandage is called the spica.

Bandages placed on the extremities should be applied more loosely as they advance from below upward, especially if the limb be flexed, in order not to interfere with the circulation. Until experience teaches the surgeon how firmly turns of a bandage can, with safety, be drawn, they should be applied loosely rather than tightly. When used to retain dressings or splints, a number of moderately firm turns, passing and repassing over one another, will secure better fixation than a single layer drawn dangerously tight. All firmly-applied dressings of the extremities should leave the fingers and toes exposed; the patients should

be seen within a few hours, when, if the parts do not feel easy, or if a duskiness of the exposed portions is seen, or numbness of the fingers or toes is complained of, the dressings should be loosened. If a pin secures the end of a bandage, it should be introduced point downward. In bandaging the arm to the chest, etc., a pad must be interposed to prevent chafing. Skin must never be in contact with skin.

How to Bandage.—There is not a more important art connected with domestic surgery than that of bandaging. To do it well requires practice and no little judgment. The material employed in bandaging is usually stout, unbleached cotton, from two or three to nine or ten inches wide, and from six to twelve yards long; the former length and breadth will do best for the leg.

Bandaging the Leg.—If commenced at the ball of the foot, and evenly applied so that each fold overlaps the other about one-third, it will reach to the knee. Page 578 will best show the mode of application. The bandage having been first tightly rolled up, is taken in the right hand of the operator; the end is passed under the foot, and held there by the left hand until it is secured by one turn of the bandage over it; an upward direction is then taken, so that a couple of folds brings the bandage up to the front of the leg, over the instep; the next turn will naturally pass above the heel behind; and then, if proper care be observed, it will go on fold above fold, each overlapping the other slightly, all up the leg. The bandage is passed from the right to the left hand each time it goes around the leg, and great care should be taken to hold it firmly and equalize the pressure, as well as to smooth out any wrinkles that may occur in the process of binding. A firm and even support is thus afforded to the limb, which is not likely to crease, or get displaced by the motion which may be afterwards necessary; it may be made fast above the calf by a couple of pins, or a needle and thread. Great care should be taken in this, as in all similar operations, to get the bandage rolled up tightly and smoothly before commencing; it may thus be grasped in the hand and kept well under the command of the operator, who should on no account let go his hold of the bandage so as to relax the pressure.

Bandaging the Arm.—The arm does not require so long or broad a bandage as the leg, about two inches, by three or four yards, being the average size. This limb is rather more difficult to manage, half turns being necessary to effect a proper envelopment. How this is effected may be seen by Fig. 79. The bandage is folded back upon itself, so as to take a different direction, and cover the space which would

be left exposed by the ordinary method of folding; these half turns, unless they are done tightly and evenly, will be be apt to slip and derange the whole binding. Some operators avoid half turns by letting the roller take its course, and then coming back to cover the exposed parts; but this method, besides requiring a larger bandage, does not effect the required purpose so neatly and efficiently. One mode of fastening a bandage is to split it up a short distance so as to leave two ends, which can be passed around the limb and tied. It should always be borne in mind that the chief art in applying bandages is to give firm and uniform support, without undue pressure upon any part; and to effect this properly, the strain, in winding, should be upon the whole roll held in the hand, and not upon the unrolled portion of it. This strain should not be relaxed during the progress of the operation.

Many-Tailed Bandage.—Page 578 represents the mode of applying what is called a many-tailed bandage—useful to apply over a wound or wherever it requires frequent changing, or in cases in which it is desirable not to exhaust the patient by much movement of the limb. This is a strip of cotton somewhat longer than the limb to be enveloped; on it are sewed, at right angles, other strips, about one-half longer than the circumference of the limb, each overlapping the other about one-third of its breadth, so that when drawn tightly over in regular succession each secures the other. The end of the strip passes under the heel, and, coming up to the other side, is made fast to the bandage there, and so all is kept firm.

Cross Bandage.—For keeping poultices on the lower part of the back, or in the groin, a cross bandage is used, the fashion of which is this: make a cotton band, large enough to pass around the loins, and tie a buckle in front; to this is attached another piece, which proceeds from the center of the back to the anus, where it divides into two, which pass under the thighs, up on either side, and are fastened to the band in front. The bandage is used to close a vein after bleeding and is made thus: lay the tape obliquely across the wound, pass it around the arm above the elbow, and bring it back again over the same spot; then let it go around the arm below the elbow, and, returning, let the two ends be tied in a secure bow, in the bend of the arm, with the free movement of which the bandage should not be tight enough to interfere, although it must be sufficiently so to retain its position. This mode of bandaging is called the figure of eight, from its resemblance to that figure. Page 578 will make the explanation clearer.

For a Sprained Ankle.—Place the end of the bandage upon the

instep, then carry it around and bring it over the same part again, and thence around the foot two or three times, finishing off with a turn or two around the leg above the ankle.

For a Sprained Wrist.—Begin by passing the bandage around the hand, across and across, like the figure eight; exclude the thumb, and finish with a turn or two around the wrist.

For a Cut Finger.—Pass the bandage (a narrow one) around the finger several times, winding from the top, and splitting the end; fasten by tying around the thick part above the cut; or, if it be high up, tie around the wrist.

Bandage for the Eyes.—The best bandage for the eyes is an old silk handkerchief passed over the forehead and tied at the back of the head. For the head itself, it is best to have a cross bandage, or rather two bandages—one passing across the forehead and around the back of the head, and the other over the top of the head and below the chin. Or, better than this, perhaps, a large handkerchief which will extend all over the forehead and crown, two ends of it passing to the back, and, after crossing, from thence around the neck, and tying the other two beneath the chin. For a bandage to support a pad or poultice under the armpit, a handkerchief may be used, or a broad piece of cotton, arranged in the same way, or the T-bandage for the eye, as shown on page 582.

For Fracture of the Ribs.—Bandages should be about nine inches wide and drawn around the body very tightly. In this case, as in that of any other fracture or discoloration, only a properly qualified person should attempt their application. (See articles on Dislocations and Fractures.)

The T Bandage.—We have not as yet spoken of the T bandage, which is simply a broad band to pass around the body, or elsewhere, having attached to it one of the same width, or narrower, like the upright part of the letter after which it is named; or, there may be two stems—if they can be so called—in which case it is a double T bandage, as in Fig. 75.

Starch bandages are those in which the roller, before it is put on, is saturated in a strong solution of starch. Sometimes a covering of brown paper is put over this, and another dry bandage is applied. This makes a firm and compact case for the limb. It is useful in cases of fracture, especially if the patient has to be removed to a distance. Sometimes, when it is not desirable to make the covering so thick and durable, the displacement of the bandages is guarded against by brushing a weak solution of starch or gum over the folds.

FIG. 68. FIGURE-OF-8 ANKLE BANDAGE.

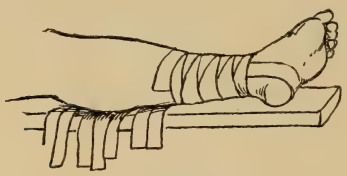

FIG. 69. MANY-TAILED BANDAGE FOR THE LEG.

FIG. 70. SPICA BANDAGE OF THE FOOT.

FIG. 71. DEMIGAUNTLET BANDAGE.

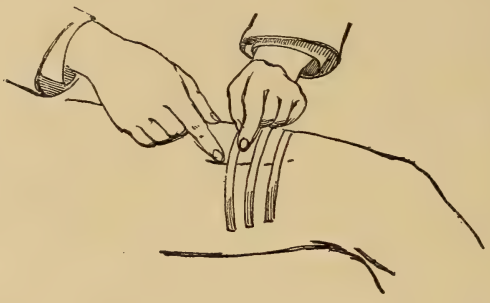

FIG. 72. APPLYING ADHESIVE PLASTER TO A WOUND.

FIG. 73. SPIRAL BANDAGE OF THE FINGER.

FIG. 74. GAUNTLET BANDAGE.

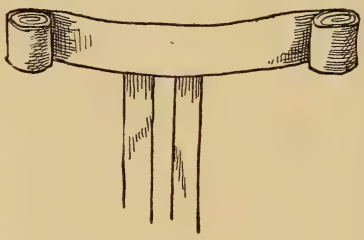

FIG. 75. T-BANDAGE.

FIG. 76. SPICA BANDAGE OF THE HAND.

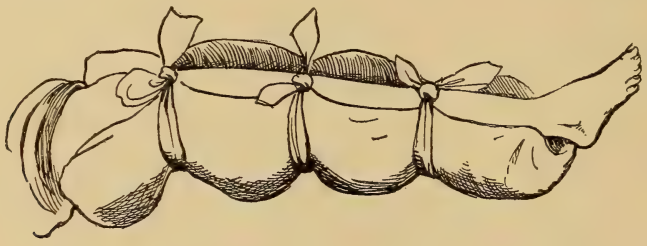

FIG. 77. PILLOW USED AS A SPLINT FOR A FRACTURED LEG.

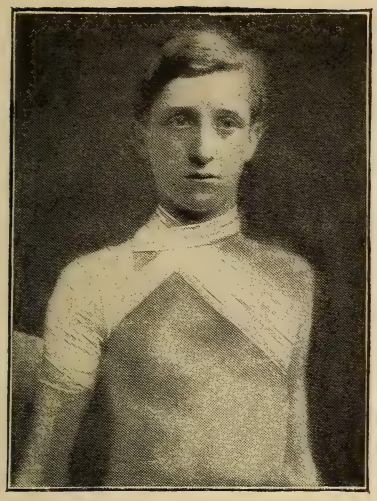

FIG. 78. BANDAGE FOR DISLOCATED SHOULDER.

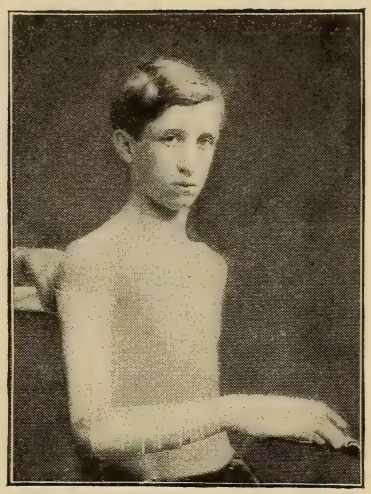

FIG. 79. BANDAGE FOR UPPER AND LOWER ARM AND HAND.

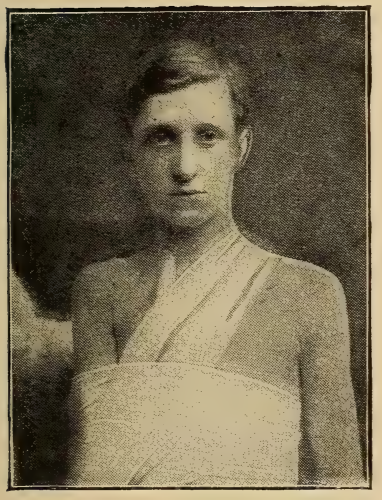

FIG. 80. BANDAGE FOR FRACTURED ARM OR SHOULDER BLADE.

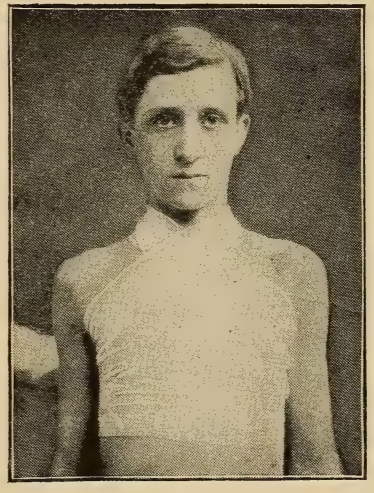

FIG. 81. DRESSING FOR FRACTURED RIBS.

Bandaging should be performed, in nearly all cases, from the extremities upwards, or inwards to the heart, except where the injury is situated above the seat of the vital action. If they give much pain, there is reason to suspect inflammatory swelling beneath; and they should be loosened, if moistening with cold water does not relieve the pain. Flannel for bandages is used where warmth, as well as support, is required.

HEMORRHAGE.

Hemorrhage is invariably present when a vessel is wounded. The blood may escape through the broken skin, or may extravasate beneath the skin and form a discoloration. The occurrence of severe hemorrhage is always attended with great danger to life, and the larger the caliber of the wounded vessel, the greater the immediate danger. There is no other emergency which the surgeon is called upon to meet that requires so much judgment and presence of mind as the proper management of an alarming hemorrhage.

There are four varieties of hemorrhage, as follows:—

Arterial Hemorrhage is characterized by bright-red blood spurting out in jets, keeping time with the action of the heart. The bright-red color is due to the presence of oxygen in the blood. Arterial blood may be deprived of its characteristic color when the oxygen is greatly diminished and carbonic acid gas is present in excess, as in profound narcosis, or when an operation is undertaken to avert death from apnœa. During an operation, therefore, the surgeon always looks to the anesthetic if the blood from the wound becomes dark colored.

Venous Hemorrhage is characterized by the blood flowing in an uninterrupted stream and by its dark color. The steady flow of the blood from the veins is due to the fact that the intermittent heart impulse is lost. For the same reason blood from the distal end of a wounded artery also flows in a steady stream. The dark color is caused by the non-oxygenation of the blood and by the presence of carbonic acid gas.

Capillary Hemorrhage is characterized by its constant oozing on the one hand, and by its spontaneous arrest on the other. This variety of hemorrhage is alarming in exceptional cases only, but its persistence often makes it a troublesome variety to treat. The capillaries in the mucous membranes bleed most profusely. Hemorrhage from capillaries situated in the skin usually ceases, owing to the contraction of the wound.

Hemorrhage may be divided also into primary, intermediary, and secondary.

FIG. 82. DESAULT'S BANDAGE.

FIG. 83. SPICA BANDAGE FOR SHOULDER.

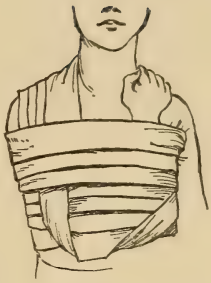

FIG. 84. VELPEAU'S BANDAGE.

FIG. 85. SPICA BANDAGE FOR THE GROIN.

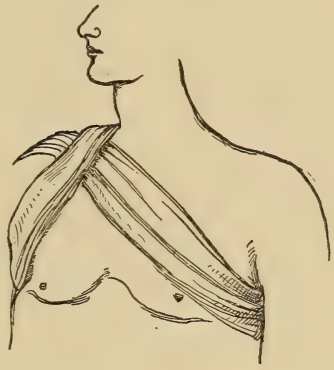

FIG. 86.

FIG. 87. EIGHT-TAILED BANDAGE FOR THE ABDOMEN

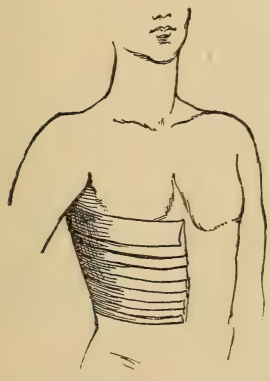

FIG. 88. ADHESIVE PLASTER APPLIED TO FRACTURED RIBS.

FIG. 89. FIGURE-OF-8 BANDAGE APPLIED TO THE ELBOW.

FIG. 90. FOUR-TAILED BANDAGE FOR THE HEAD.

FIG. 91. BARTON'S BANDAGE.

FIG. 92. FOUR-TAILED BANDAGE FOR THE HEAD.

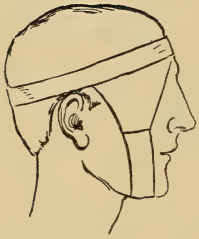

FIG. 93. T-BANDAGE FOR THE EYE.

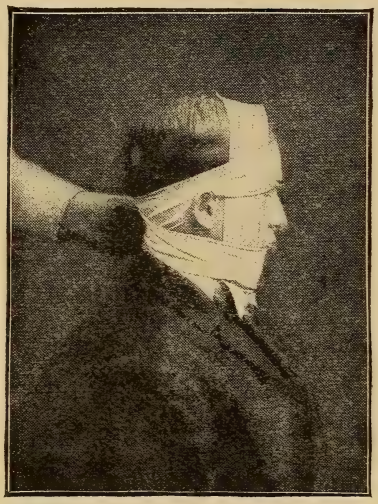

FIG. 94. BANDAGE FOR FRACTURE OF THE JAW.

FIG. 95. AGNEW'S BANDAGE.

FIG. 96. HEAD BANDAGE.

FIG. 97. HEAD BANDAGE.

FIG. 98. FOUR-TAILED HEAD BANDAGE.

Primary hemorrhage occurs immediately after the wound in the vessel. Intermediary hemorrhage usually takes place within twenty-four hours, and is caused by a ligature's coming away, or by the action of the heart in driving out coagulated blood, or by some movement of the wounded part. Secondary hemorrhage occurs after twenty-four hours and before the uniting of the wound, and most frequently between the fifth and tenth days.

Arteries.—These may be punctured, contused, lacerated, gunshot, or incised. Besides the varieties just mentioned, there may also be rupture.

A punctured wound is caused by the penetration of the artery by a sharp or by a thin blunt instrument. If the opening is very small, hemorrhage may not result, but, if the puncture is of any size, bleeding occurs.

A contused or bruised wound of an artery may be insignificant, or it may be of sufficient magnitude to cause gangrene by obliteration of the vessel, or death by secondary hemorrhage. If a clot forms in a contused artery, which supplies some internal organ with blood, the organ, having been deprived of its nutriment, will undergo degeneration. The contusion may be extensive enough to destroy the coats of the vessel, so that a fatal secondary hemorrhage follows the separation of the slough.

A lacerated wound of an artery deserves special attention, because the results are likely to become serious. In a lacerated wound of an artery the external coat is drawn out so completely as to lose its normal elasticity, in the same manner as a piece of rubber tubing will lose its elasticity when it is overstretched. Such an injury to an artery of large or small size may occur without any bleeding. The vessel is, however, permanently injured.

A gunshot wound of an artery derives its special importance from the fact that secondary hemorrhage is likely to occur. The vessel may be only contused by a bullet, and no bleeding occur until some days after the injury, when serious hemorrhage supervenes as a result of sloughing. A gunshot wound of an artery is often associated with injury to the accompanying vein. In case an extremity is blown off by shot or shell, the hemorrhage is often slight, on account of the fact that the vessels are lacerated, the middle and internal coats contract, curl up, and a plug is formed at the open end of the vessel. If, however, a rifle bullet enters the body when it is traveling at great speed, it may cut an artery like a knife, causing immediate and alarming hemorrhage. In addition to the primary or secondary hemorrhage, which may be produced by a gunshot wound of an artery, the contusion of the vessel may lead to the

formation of a clot, which may cause closure of the artery and be followed by gangrene.

An incised wound of an artery is an injury inflicted by some sharp, cutting instrument. The hemorrhage is always profuse in such a wound, because there is no mechanical obstacle to the outflow of blood through the opening, such as is often found at the open mouth of a torn artery, and also because the contraction of the two ends of the vessel causes the wound in the artery to gape. The direction of the incised wound may be transverse, oblique, or longitudinal. The hemorrhage is very profuse in a transverse cut of an artery, while it is not so abundant in an oblique incision. If the artery is upon the stretch and is wounded longitudinally, the bleeding is very slight, but may become very alarming when the artery is relaxed. In case of a partially divided artery the rule is to divide the vessel completely and tie both ends.

Rupture of one or all of the coats of an artery is an injury that occurs under certain circumstances. This accident is not followed by hemorrhage, but is a condition favorable to the production of secondary hemorrhage by sloughing, or to the development of an aneurism, or soft pulsating tumor. The rupture may be complete, in which case the artery is in the condition of a lacerated vessel. If the rupture is partial and a clot has formed, then the pulsation below is lost and gangrene may supervene.

If the wound is a contused one, the treatment consists in securing as much physical rest for the artery as possible by absolute quiet and the administration of heart depressants. The possibility of the occurrence of secondary hemorrhage must not be forgotten, and measures to arrest it must be instituted immediately if it appears. The area or extremity, which may be deprived of blood as a result of a contusion of an artery, must be kept artificially warm in order to encourage the determination of blood to the part and to stimulate the circulation.

If the wound is a lacerated one, the primary hemorrhage is usually slight on account of the curling up of the internal coat and the contraction of the middle coat, and the coagulation of the blood at the torn end of the vessel; but on account of the danger of secondary hemorrhage both ends of the vessel should be diligently sought, by a careful dissection if necessary, and securely tied.

If the wound is a gunshot one, the primary hemorrhage must be treated according to the same principles that would guide the person in the management of an ordinary wounded artery. If the vessel is one of large size, pressure directly upon the artery and in the wound is indicated for the instantaneous arrest of the bleeding. An elastic

bandage should now be applied. If the hemorrhage comes from an artery situated in the neck, or in any other place where the application of an elastic bandage is impracticable, the dressing of such a wound should be conducted with the most rigid adherence to the principles of aseptic surgery in order to prevent secondary hemorrhage, a danger which is peculiarly frequent after gunshot wounds. The occurrence of gangrene is also a complication of an exceedingly fatal character in gunshot wounds, since blood poisoning rapidly develops. If the main artery of the limb is injured, and also its accompanying vein and nerve, even without a fracture of the bone, as a rule, amputation is necessary to avert gangrene, which would almost surely follow.

If secondary hemorrhage occurs, it will be during the second or third week—that is, at the time when the sloughs separate. The bleeding should be arrested, if possible, at the site of the hemorrhage. If the hemorrhage is alarming and it comes from several points, and the pus formation is extensive, amputation of the limb is indicated. The best way to prevent secondary hemorrhage is to keep the wound aseptic and to provide sufficient drainage. Good, nutritious diet is required in order to maintain a high standard of vitality, which conduces to repair of the wound and averts the dangers of exhaustion, suppuration, and blood poisoning.

In case of a ruptured artery the treatment is practically the same as would govern in the management of a contused or lacerated vessel.

Bleeding from the Nose may be treated by laying the patient upon the back and applying hot or cold applications to the back of the neck; cotton, saturated with vinegar, applied to the nose, is of benefit in some cases.

Bleeding (Hemorrhage) from the Lungs cannot be treated by the laity, except by laying the patient on the back and applying ice to the chest; call for a doctor.

Bleeding from the Stomach cannot be told from that of the lungs and must be treated the same. Subacetate of lead, given by mouth, is the proper treatment.

Bleeding from the Rectum and Upper Bowels are known apart only from color of blood; if light, it is from the lower bowel or rectum; if dark, from the upper. Injections of hot water, mixed with vinegar or lead water, may be given. Lay the patient on the back, with the head lowered. Ice in the rectum may be used.

Bleeding from the Teeth is most common in the young and very old. Some diseases causing deterioration of the blood vessels, are apt

to allow profuse bleeding upon the extraction of the teeth. Applications of alum, tannic acid, or vinegar will give relief.

Hemorrhage through the Vagina is caused by many things, and will be taken up in other chapters. The emergency is of little value. Hot water douches with the addition of one teaspoonful of salt to each quart of water may be used. Placing ice over the abdomen is a remedy that may prove beneficial. The patient must be put to bed,—elevating the lower end of the bed upon a chair will give the desired position. Call a physician at once.

WOUNDS—RAILWAY AND MACHINERY ACCIDENTS.

Crushed Fingers or Toes.—Wash the parts, straighten them into their proper shape as nearly as possible, cover them with oil and bandage them with a piece of soft cotton cloth, wrung out of hot water, and then attach a splint.

Crushed Feet or Hands.—Bathe the parts with oil, wrapping in a soft dressing, such as cloth, cotton, or wool. If there is much bleeding, apply ice or cold water. Support the part by a splint and place on a level with the body. Let the patient lie down. If there is shock or depression, keep the patient warm, applying hot water bottles or hot cloths, and give only a teaspoonful of whisky or brandy in a little hot water every ten minutes.

Crushed Arms or Legs.—In such cases the shock is usually very great. The patient is to be supported, kept warm, and stimulants are to be given. Do not move the organ. If it is necessary to expose the part, cut the clothing away, and, after treatment, see that it is warmly protected.

Crushed Chest or Lower Part of the Body.—As such cases are nearly always fatal, little can be done beside provision of warmth, comfortable position, and slight stimulation by a teaspoonful of whisky or brandy in hot water every ten minutes.

Parts Torn Off.—Parts should be cleansed, treated with cold water or ice, and the patient placed in such a position that the injured part is higher than any other. When shock occurs, apply heat, if possible, to the whole body and especially to the region over the heart and the pit of the stomach. Give stimulants with a teaspoonful of brandy or whisky in a tablespoonful of hot water every ten minutes for several hours.

Bruises or Contusions.—Apply cool, wet cloths or ice bag and anoint the part with vaseline, cold cream, or similar simple ointment.

The pain may also be relieved by applications of laudanum, full strength, or mixed in equal parts with water. After the pain has subsided, apply hot cloths, which will help to prevent discoloration of the skin.

Contused Wounds.—If there is much bleeding, warm applications are better than cold ones. If dirt of any sort is present in the wound, cleanse it thoroughly and apply a simple ointment, such as vaseline or cold cream, to assist in its removal. Tincture of arnica, mixed with hot water, will also afford relief. Tincture of benzoin or Friars' Balsam may be applied on lint or absorbent cotton; it has the effect of sealing up the wound, preventing the contact of air and enabling it to heal. Its application will cause a slight smarting if the skin is broken.

Cuts or Incised Wounds.—When these are simple and small, the edges of the flesh are to be drawn together with narrow strips of adhesive plaster after the parts have been well cleansed. For the latter purpose a few drops of carbolic acid in a quart of water makes an excellent wash. The more care taken in bringing the edges nearly together, the less danger there is of an unsightly scar remaining. A wash with a little collodion applied with a camel's-hair brush makes an effective dressing. A bandage is then applied for additional protection. In larger and longer cuts, some stitches are necessary. While this is a matter wholly relegated to the surgeon, in cases where he cannot be reached it is only a matter of nerve and a little ingenuity. A needle and black silk or cotton thread, both boiled for five minutes before using to prevent infection, are all that are required. The stitches are to be taken well back from the edges of the wound so as to insure that they will hold. A dusting of iodoform will assist the healing process.

Torn or Lacerated Wounds.—The torn parts are to be thoroughly washed so that all dirt and other foreign matter is completely removed. Then apply a cool, wet cloth, or one soaked in laudanum or equal parts of laudanum and water, or with alcohol. When there is shock or depression, warmth, rest, and stimulation from small, frequent doses of whisky or brandy in hot water are required.

Punctured Wounds.—First ascertain whether or not any part of the needle, pin, tack, nail, or other object has broken off in the wound. Soak the part in hot water and squeeze out a little blood if bleeding has not occurred. This is to remove any poisonous matter, which is the great fear in such cases. If puncture of the abdomen, chest, or head occurs, a physician must be called at once, as the vital organs may be injured. If a rusty nail or wire is the cause of the wound, there is need of having it cauterized (or burned).

FIG. 99. FOR STOPPING A HEMORRHAGE.

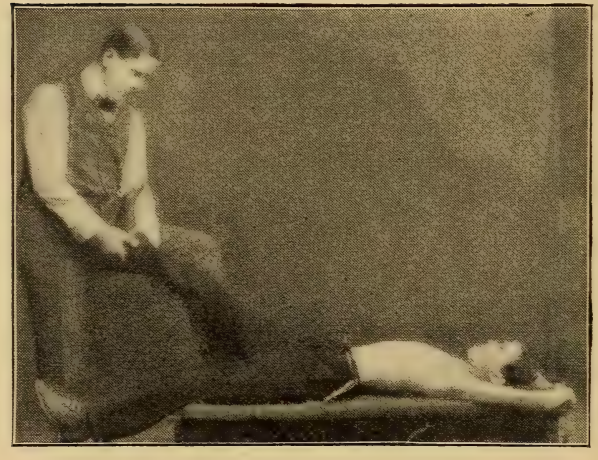

FIG. 100. EXTENSION OF A LIMB IN FRACTURE.

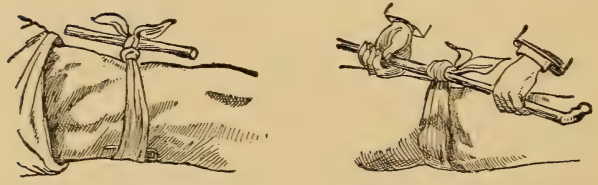

FIG. 101. TOURNIQUETS FOR STOPPING EXCESSIVE BLEEDING.

HEALING OF WOUNDS.

Under the condition of asepsis we are now able to see wounds heal without the usual phenomena of inflammation. The symptoms of inflammation are brought about by the disturbed functions of tissues which have been damaged. Repair, on the other hand, is the result of an active process by means of which the cells of the part are enabled to replace the tissues which have been destroyed.

In healing by first intention, or primary union, repair takes place without suppuration. The bleeding of the smaller vessels soon ceases spontaneously because they are soon obstructed by the formation of a clot. The largest vessels are controlled by pressure, twisting, or ligature. When the blood has been washed or wiped away, the edges of the wound are carefully adjusted. If such a wound has been kept perfectly aseptic—that is, if no bacteria have been allowed to gain access to it—we shall see but little change in the appearance of its edges during the healing process.

FRACTURES.

Definition.—By fracture in the surgical sense we mean the breaking of a bone or cartilage. The several sorts of fracture are:—

Compound or Open Fracture.—That in which the seat of fracture communicates with the exterior through a wound of the overlying parts.

Simple or Closed Fracture.—That which does not communicate with the exterior.

Other general terms used are: spontaneous fracture—one produced by very slight violence, presumably aided by abnormal weakness of the bone; ununited fracture—one by which bony union has not yet taken place, after the lapse of a period of time that is usually sufficient for repair; fracture by direct violence—one in which the bone is broken by external violence applied at the seat of the fracture; fracture by indirect violence—one in which the force is applied to the bone at a distance from the seat of fracture. A comminuted fracture is one in which the bone is much shattered. Green-stick fracture is an incomplete fracture in which the fibers of the bone are unbroken but twisted.

Symptoms.—Pain; tenderness; loss of use of the part; fever; deformity; inflammatory swelling; unnatural freedom of movement; and crepitus. This last named symptom is a grating sound and sensation given when the broken ends of the bones are slightly moved over one another. It is the most reliable symptom.

General Treatment.—Setting the fracture by pulling the parts so as to bring the broken ends together; retention of the parts in their proper position by splints, bandages, and other means.

Fracture of the Leg.—Treat the patient, if possible, on the spot where the accident has occurred. Do not touch or handle the limb until all splints and bandages are ready. Handle the limb with the utmost care and gentleness, so as to avoid all unnecessary suffering. When splints and bandages are ready, grasp the limb above and below the fracture and pull with a gentle, steady force, so as to bring the two extremities of the broken bone as nearly as possible together, then apply the splints and bandages so as to make the patient comfortable and to render his removal easy. Under no circumstances must the patient be allowed to place his weight upon the injured member. The jagged ends of the bone will lacerate the muscles if any motion of the limb is permitted. In some cases the fractures may be reduced by pulling the foot in a straight line with the body. Swelling occurs almost at once; unless this is kept down the surgeon will have much difficulty both in diagnosing the case and in reducing the fracture. Hot cloths or applications of ice are the best means of keeping down the swelling. If the fracture is compound, that is, if the ends of the bone protrude through the flesh, there is danger of infection or of blood poisoning. The wound should be cleansed with pure soap and water. A few drops of carbolic acid added to a quart of water makes an ideal wash. After this, the part should be dried with a clean towel and bandaged with a clean cloth. (See "Splints and Bandages," page 572, and "Modes of Transportation," page 571.) When the leg is broken below the knee, the fracture should be reduced by pulling upon the foot; a pillow is then placed under it and the leg and pillow are firmly bound together by three bandages distributed equally along its length and tied above and over the shin. If splints are used, apply one on each side of the leg, and bind these with strong bandages arranged so that the knots come over one of the splints and not over the leg.

Fracture of the Arm.—This fracture may be reduced by either grasping the arm above and below the fracture or by pulling on the hand with slight force in a straight line and continuing to exert this force until splints and bandages are applied. If it is necessary to transport the patient any considerable distance, carrying the arm close to the side with a weight in the hand, such as a heavy flatiron, will insure relief from pain. Where the small bones of the hand are fractured, almost

the only treatment possible in an emergency is the application of either hot cloths or of ice to keep down the inflammation and swelling.

Fracture of the Skull.—Remove the patient to a cool, dry place, placing him in a recumbent position. Apply ice to the head and avoid anything which will tend to excite the patient. Place clean cotton or cloth over the head and make no attempt to stop the flow of blood, unless an artery is severed. In removing the patient, place on a stretcher, shutter, or wide board with the head raised higher than the rest of the body, and observe great care in carrying him. The room in which he is placed should be darkened and kept absolutely quiet. Hot water bottles may be placed at the feet and an ice bag at the head. Give alcoholic stimulants.

Fracture of the Jaw.—The broken ends of the bone are to be gently forced into their natural position, and are to be so retained by a bandage. In case of bleeding, let the patient rinse his mouth out frequently with cold water or small pieces of ice. He must not be permitted to talk.

Fracture of the Spine.—This is to be suspected when there is paralysis of the parts below the seat of the injury. Do not move the patient until medical assistance arrives if it can be avoided. As this injury is nearly always accompanied by shock, give alcoholic stimulants in small quantities and apply hot water bottles to the feet. If the patient must be removed, a shutter or board is preferable to a canvas stretcher, as the former will not permit of so much motion as does the latter. Place the patient on his back, carrying him as gently as possible, and avoid jolting.

Fracture of the Ribs.—If there is no evidence of injury to the lungs, a bandage is to be tightly tied around the chest over the seat of the injury. If there is evidence of internal injury, do not bandage at all. Place the patient in bed with head and upper part of the body elevated. In carrying the patient this position is also to be observed. As the pain is greatly increased by the act of breathing, strips of adhesive plaster may be placed around the chest over the seat of the injury. These strips should be about two inches wide and extend from the spinal column a little beyond the breastbone. Begin to apply them from below and work upwards allowing the strips to overlap about an inch.

Fracture of the Collar Bone.—Make a pad of cotton in the form of a wedge about three inches wide at the base and running up to a point;

place this in armpit with the broad end upwards. Place the arm close to the side and push the elbow up as high as possible, carrying the forearm across the chest with the head pointing to the opposite shoulder, the elbow carried as far back as possible. Retain this position by means of a broad bandage. Arrange the bandage in such a way as to take the weight of the arm off the shoulder.

Fracture of the Fingers.—Reduce the fracture by pulling directly in a straight line below the seat of the injury. Arrange a splint extending from the elbow to the tips of the fingers and attach hand and arm to it by means of a bandage so arranged that the pressure comes directly over the fingers. Bind the arm and elbow and arrange a sling bandage in which the injured member may be carried.

Fracture of the Kneecap.—Take a long splint reaching the entire length of the leg. Straighten the limb and apply the splint to the back of the leg. Tie this to the limb by means of one bandage around the thigh and another around the lower leg, then tie the two feet together around the ankles. The patient may be carried on a stretcher, and placed in a bed with a very low pillow.

SPRAINS.

Sprained Wrist.—Make a splint the width of the hand and tapering to the width of the wrist. Let it be long enough to extend from the tips of the fingers to the elbow. Pad the upper surface of this with cotton or wool or old table linen to make a soft rest for the hand and arm. Lay the hand upon it palm down and pass a broad strip of adhesive plaster around both splint and arm above the wrist, and a similar one just below the wrist. A bandage may then be applied over all. This secures rest, the first essential.

To reduce swelling, bathe the wrist with cold water or with hot water, as may be most agreeable to the patient, or, wrap cloths kept wet around the joint.

Massage, very gentle at first and gradually increasing in force, is extremely beneficial.

Sprained Ankle.—Movement of the joint is best prevented by strips of adhesive plaster passed up and down and partly around the ankle, but not so as to bind tightly when the swelling occurs, nor to interfere with the circulation.

Swelling is reduced by either hot or cold applications. The foot is to be placed in an elevated position. Massage should be begun early, usually on the first day. If the rubbing is gentle at first it will be well

borne, and the force employed may be increased at each succeeding treatment.

Prognosis.—Sprains range through all degrees of severity. Some are so severe and are so slow in getting well that it has been said that a sprain is worse than a break. As the joints of the wrist and the ankle are so complicated, it is an extremely difficult matter to tell whether the injury is not accompanied by a fracture or crack of some of the bones. The swelling adds to the difficulty of correct diagnosis. X-ray examination has shown that many supposed sprains were in reality fractures.

The discoloration of the skin is due to the flow of blood into the cavity of the joint and through the tissues. Blood clots form and adhesion of the parts often interferes with the usefulness of the joint.

DISLOCATION OF THE ELBOW.

Treatment.—Take the patient by the hand and forearm and pull with increasing force until the joint slips into place with a snap. Not much is required in ordinary cases. When the joint has slipped into place, the arm should be bandaged on a splint covering the elbow joint. It should be kept in its place in this way for five or six weeks.

Symptoms.—The joint is motionless; a little bent; a projection behind, formed by the elbow, which, with its tendon, is pushed back. The joint can be neither bent nor straightened. Great care is needed to distinguish between a dislocation of the elbow joint and a fracture at this point. When both bones of the elbow are forced forward, the elbow is broken. The imperfect line of the joint will be readily observed when a comparison is made with the opposite joint.

DISLOCATION OF THE LOWER JAW.

Treatment.—Place the patient in a low chair or seat. Pass the thumbs, well protected with several thicknesses of cloth, into the mouth. Press with force, slowly applied, on the last four teeth, and at the same time raise the chin, pushing the jaw backward. As soon as the jaws start to slip into place, the operator is advised to slip the thumbs off the teeth into the cheeks to avoid the pinching which is caused by the sudden reaction of the muscles, which have been unduly stretched. The pressure required by the thumb is considerable.

Symptoms.—The mouth is fixed open; pain in front of the ear; pain extending upward into the temples.

Causes.—This state of the jaw occurs suddenly, while gaping, eating, talking, while the jaw is in motion. It is very likely to recur.

DISLOCATION OF THE SHOULDER.

Lay the patient down at full length, on the floor if nothing better offers; place yourself alongside of him in the reverse position—that is, with your feet toward his head. Remove your boot or shoe from the foot that is nearest to him. Place your foot in his armpit; take the hand of the dislocated arm; press the foot up in the armpit for a leverage; pull upon the hand. At the same time carry the hand rather across the body towards the well side. This, with the leverage of the foot in the armpit, has the effect of prying the end of the long bone upward and outward so that, if sufficient force is exerted, the head of the long bone of the arm will snap into place. Sometimes the ligaments and muscles bind so tightly that the dislocation will not yield to your strength. In such cases it is better to wait for the doctor, who will probably administer an anesthetic, which has the effect of relaxing the strain of the parts.

After the dislocation has been reduced, bind the arm to the side with the hand resting on the opposite shoulder.

Dislocation of the shoulder is the most frequent of all dislocations. It composes nearly one-half of all dislocations.

DISLOCATION OF THE FINGERS.

Treatment.—These are usually easily reduced by strong pulling and a little pressure on the ends of the bones forming the joint. The parts are then to be kept in position by means of a splint and a bandage, or strips of adhesive plaster.

DISLOCATION OF THE THUMB.

Treatment.—This is often a matter of great difficulty to even an experienced surgeon. If pulling in a straight line will not reduce the dislocation, the thumb is bent backwards towards the wrist and pressure made at the same time on the end of the thumb bone at the point of dislocation so as to push it away from the wrist. The pressure at the same time is exerted downwards towards the palm of the hand. A splint or strips of adhesive plaster are required to keep the part in place.

DOMESTIC EMERGENCIES.

Infantile Spasms.—Convulsions similar to those seen in cases of epilepsy often occur in infancy and occasionally among adults. They may be identical with epilepsy, but in early childhood are not necessarily followed by that disease. They differ from the former in that the spasms of infants subside when their cause is removed, while epileptic spasms continue.

Causes.—Convulsions may be due to a variety of causes, producing an unsettled nervous condition, which finds expression in that way. One of the most common is debility resulting from disturbances of the digestive tract. It has been shown that the death rate in spasms is proportionate to that of stomach and intestinal troubles. Although dentition itself is not often a cause of convulsions, in a sickly, weak infant, it may assist in producing them. Overloading the stomach is one of the most common causes. The popular idea that worms often produce spasms is doubtless erroneous. Many times the onset of scarlet fever, pneumonia, or measles brings an attack, while in an adult a chill may be the first warning. Convulsions often occur with meningitis and with various brain troubles.

Symptoms.—An attack is usually preceded by a state of restlessness and perhaps grinding of the teeth. It often begins in the hands. The eyes roll up or become fixed and staring. Breathing may be suspended for a short time, causing the face to become gray or purplish, and giving it a pinched, drawn look. Then the hands and arms may twitch convulsively or be moved forward and backward, rhythmically, the eyes roll, and the head is drawn back. Gradually the convulsion subsides and the child sinks into a stupor or falls asleep.

Treatment.—If there is reason to think the attack is brought on by indigestible or too much food, an emetic should be given at once and then an enema. The teeth should be examined and, if a gum is swollen and undoubtedly causing trouble, it may be lanced. The almost universal practice of putting the child into a warm bath is excellent and should be done immediately; but a very hot bath is not to be recommended, especially if indigestion is the cause of the spasm. The temperature of the water should not be above 95° F. After the convulsion is over, and especially if there is fever, cold water or an ice bag may be put to the head.

Colic commences with a feeling of pressure, then severe griping pains in the stomach, faintness, and cold extremities. For the paroxysm, hypodermic injections may be given by a physician; galvanic electricity, if a battery is handy; a hot water bag over the stomach is excellent.

Diarrhœa.—If the tongue is coated, the breath bad, and the stools not excessive in number, clean out the bowels by a mild laxative. Eating should be suspended for a time; an occasional glass of milk may be taken and mild stimulants; rest in bed, hot baths, sweating, and induced activity of the kidneys are to be recommended.

Dysentery.—Put the patient to bed at once; remove and disinfect all stools, as the disease is infectious; the diet should be mild but nourishing; if there is great prostration, mild stimulants may be given.

Croup.—Emetics of warm or mustard water should be given to remove the membrane; however, at the first appearance of symptoms of croup, a physician should be called.

Whooping Cough.—This disease will "run its course." Inhalations of creosote emanating from saturated cloths hung in the room or vaporized are very good. Eucalyptol is excellent to inhale. The diet should be mild and nourishing, the clothing warm, but not burdensome, and the patient kept outdoors as much as possible.

Toothache.—Insert cotton saturated with oil of cloves or carbolic acid into the cavity; place hot applications to jaw.

Earache.—Drop warm sweet oil or chloroform into ear; use hot applications.

Neuralgia.—Rest; easily digested food; for prompt relief, hypodermic injections; hot applications. A physician should be consulted and the cause removed if possible.

Vomiting.—Keep perfectly quiet, eat nothing; chopped ice may be held in the mouth; drink lemon water or "suck" the fruit.

Cholera Morbus.—Hot applications over the abdomen, brisk cathartic; hot drinks, preferably ginger; otherwise treat as for shock.

Pneumonia.—Put patient in bed; keep quiet; clear out bowels; give only milk diet; turpentine and lard may be applied to the chest; if the fever is high, cool sponges are beneficial. Summon a physician without delay.

Fever.—Keep quiet; ice may be held in the mouth; sponge with cool water if temperature is high; milk diet is best.

Asthma.—If an attack impends, drink freely of strong, black coffee; for the paroxysm, hypodermic injections afford relief; inhalation of the fumes of belladonna or chloroform, and the use of some kinds of cigarettes, will help. If attacks are frequent, systematic exercise, frequent bathing, restricted diet, and change of climate are to be recommended.

BURNS AND SCALDS.

Remove the clothing carefully so as not to break blisters or to tear away the skin. If the clothing sticks to the burned part, do not use force to remove it. Cut around the attached part, if necessary, and soak off the clothing which adheres.

If blisters have formed, open them with a needle at the edge, and allow the watery contents to run out so that the upper layer of skin will settle down on the under layer.

Apply dressings of soft linen cloth or pieces of old muslin or cotton cloth soaked in any of the following:—

Castor Oil.

Or:—

Good Olive Oil.

Or:—

Baking Soda,.....1 heaping tablespoonful.
Water,.....1 pint.

This is one of the best remedies that can be employed.

Or:—

Vaseline applied to a soft cloth.

Or:—

Raw White of an Egg applied on a cloth.

Or:—

Linseed Oil,.....1 cupful.
Limewater,.....1 pint.

This is known as Carron Oil and is excellent; used in hospitals.

Or:—

Carbolic Acid,.....1 teaspoonful.
Glycerine,.....2 tablespoonfuls.
Olive Oil,.....1 pint.

If the patient faints from shock, place the ammonia bottle or smelling salts to the nose and give only moderate quantities of a stimulant such as brandy and water or aromatic spirits of ammonia.

If the pain is intense and the burn very severe, the pain is allayed by giving laudanum. An adult takes thirty drops; a child takes as many drops as he is years old.

CLOTHES CATCHING FIRE.

Wrap the person in a woolen covering such as: a rug, a blanket, a carpet, a shawl or a coat. Wrap it around closely so as to shut out the air from the flames and smother them. Do not let the person run about in fright. That only fans the flames and makes them burn the faster.

Whatever is used to smother the flames is to be wrapped snugly around the neck so as to keep the flames from the face.

Then treat the burn as directed above.

Do not use a cotton material in an attempt to smother the flames. Cotton burns too easily and only feeds the flames.

BURNS WITH ACIDS.

Bathe the parts liberally wth water so as to wash away all acid from the part.

Then treat as directed above for ordinary burns.

BURNS WITH LYE AND ALKALIES.

Wash the part with vinegar and apply oil.

Nature of Burns and Scalds.—Scalds are likely to be more extensive, because the clothing carries the fluid over the body. In burns it is more likely to protect the body.

There are three degrees of burns and scalds, viz.: (1) Those presenting only a reddened surface. (2) Those in which the skin is blistered. (3) Those in which the flesh is involved.

Prognosis.—The prognosis depends upon the extent and the depth of the injury.

Reddening of two-thirds of the skin will probably produce death.

Destruction of the skin on one-third of the body will produce death.

Where the flesh is involved, the result depends upon the location and depth of the injury and the age, sex, and previous health of the patient.

When death results very soon after the accident, it is caused by shock and the reaction from congestion of the internal organs. Death at a later period comes from exhaustion, blood poisoning, or lockjaw.

The pain varies from moderate to intense agony.

BITES AND STINGS OF INSECTS.

Minor and Common Insects.—Fleas, mosquitoes, bedbugs, various forms of mites, etc.; bees, wasps, hornets, yellow jackets, etc.; spiders, centipedes, tarantulas, and scorpions.

Treatment.—Make a paste of baking powder and water and apply to the part.

Bathe the part in dilute ammonia (hartshorn).

If these are not at hand, make a poultice of ordinary loam or earth, and apply it to the part.

If the sting is visible, remove it with forceps or pliers before treatment.

Apply wet salt to the part.

Bind a slice of onion over the wounded point.

The poison by which a bite or sting from an insect inoculates is acid in chemical properties, therefore any alkali, such as ammonia or soda, at once neutralizes the poison.

Prognosis.—As a rule, the stings and bites of even the most venomous of the insects are not dangerous to life. Where a great number of insects attack a person at once, as a swarm of bees or a nest of hornets, it is possible for one to be stung to death. A person who is very weak may suffer great constitutional disturbance marked by chills, fever, great prostration, and even death. The wounds inflicted by spiders and scorpions of the largest size rarely prove fatal.

SNAKE BITES.

Treatment.—If the snake is considered venomous, and the wound is in the extremities, tie a broad band or strap around the limb above the bite, and draw it tight enough to stop the circulation of the blood in the limb.

Suck the poison vigorously out of the wound. Take care that there are no wounds or sores or other breaking of the skin in the mouth for the poison to enter. If there are none, the poison may be safely taken into the mouth.

Or:—

Burn the wound with a hot iron so as to close up the ends of all of the absorbent vessels.

Or:—

Cut out the wound so as to remove all of the poison.

The free use of alcoholic stimulants should be resorted to. Only a moderate degree of intoxication is to be permitted. The alcohol does not act as an antidote to the poison, but only sustains the system and eliminates fear, which is a potent factor in the condition of the person.

The strap or ligature around the limb is to be loosened after the wound has been sucked, cut out, or burned; but the slackening is to be only for a moment at a time. Then tighten it again. Slacken and tighten at intervals of a few minutes to permit such poison as there may be left in and near the wound to enter the circulation only a little at a time, while the general means of overcoming the effects are being employed.

For an unskilled person, the hot iron is the best to use. Don't be afraid to use it vigorously on the wound. Remember you are trying to save the person's life.

If no one present has the nerve to cauterize the wound or to cut it

out, put gunpowder on the wound and set fire to it. Repeat until the wound is well cauterized.

Touch the wound with strong nitric acid.

Apply a strong solution of potassium permanganate.

Wash the wound thoroughly and then apply a twenty-five per cent solution of carbolic acid, made by mixing one teaspoonful of carbolic acid with three teaspoonfuls of water.

Counteract the shock by rubbing the patient vigorously; give strong coffee; apply the ammonia bottle to his nose; give whisky in from 2 to 8 teaspoonful doses or more every ten or fifteen minutes. Also give aromatic spirits of ammonia in teaspoonful doses in a little water every ten or fifteen minutes.

If breathing is difficult, use artificial respiration and keep it up for several hours if necessary.

The patient should be kept warm, perspiration should be free, and he should be as quiet as the treatment will permit. Give him plenty of fresh air.

Symptoms of Snake Poisoning.—After the poison has entered the circulation there are: severe pain in the part bitten; shock; intense thirst; skin clammy; swelling of the part; black and blue discoloration; nausea and vomiting; labored breathing; hemorrhages; bloody stools and urine; convulsions; and death.

Prognosis of Snake Bite.—There are, in the United States, twenty-seven species of poisonous snakes, and one poisonous lizard. Eighteen of the poisonous snakes are true rattlesnakes; the remaining varieties are moccasins, or copperheads, or vipers. The poisonous lizard is the Texan reptile known as the "Monster of Gila."

It is said that the poisonous snake is thicker than the harmless ones, and is rougher on the surface, because the scales on the back have enlargements known as keels.

CHOKING.

This accident, caused by substances getting into the gullet, or stopped between the mouth and the stomach, is extremely dangerous, and generally the effect of carelessness.

Treatment.—Slap the back smartly but not too heavily, and in the meantime let the person swallow some crumbs of bread, and drink a draught of water. Or, press a finger immediately down the throat as far as possible. Or, take large draughts of water, and make great efforts to swallow. The quantity of water distends the gullet above the lodged

food, alters its position, and both water and food pass into the stomach with a sudden jerk. A strong emetic will sometimes effect the purpose when other means fail; mustard mixed with warm water is as efficacious as any.

HYDROPHOBIA.

Immediately fasten a strap or broad band around the limb above the wound and draw tight. Apply tincture of iodine in and around the wound.

Wash the wound with hot water and suck out the poison.

Apply a twenty-five per cent solution of carbolic acid, made by mixing one teaspoonful of carbolic acid with three teaspoonfuls of water.

Cauterize the wound with hot iron, but not with nitrate of silver.

Cut out the bitten part.

Apply ammonia water to the wound.

(See "Hydrophobia," page 402.)

Do not kill the dog; keep him to see whether or not he is affected. If he has an appetite after four days, or, in case of death, if he does not die from paralysis, he is not mad and there is no fear.

Hydrophobia may result from the bite of a dog, cat, wolf, fox, or other flesh-eating animal.

SCRATCHES OR BITES OF CAT—BITE OF RAT.

Cleanse the wounds thoroughly by washing.

Squeeze the wound while held under hot water.

Wash with ten per cent solution of carbolic acid, made by mixing:—

Carbolic Acid,.....1 teaspoonful.
Water,.....9 teaspoonfuls.

Afterwards apply a simple ointment.

Prognosis.—The teeth and claws of cats and rats are often contaminated by poisonous matter, and this infects the wound. Unless the precautions mentioned are taken, blood poisoning may result.

SUNSTROKE.

Synonym.—Heat stroke, thermic fever, heat exhaustion.

Definition.—A depression of the vital powers resulting from exposure to excessive heat. The condition manifests itself as acute heat exhaustion and as true sunstroke.

Causes.—Exposure to the influence of excessive heat, either to the direct rays of the sun or artificial heat in confined quarters, or diffused atmospheric heat without proper ventilation.

Among the predisposing causes which act by lessening the power of the system to reduce the heat, are great bodily fatigue, overcrowding, and intemperance.

Symptoms.—Heat exhaustion develops with a rapid feeling of weakness and prostration, the surface cool, the face pale, the voice weak, the pulse rapid and feeble, the vision growing dim and indistinct, noises develop in the ears, the individual, overcome, becoming partially or completely unconscious. In such cases the attack of prostration is sudden the patient falling unconscious, with, perhaps, convulsions.

Sunstroke.—The symptoms, developing suddenly, are insensibility, with or without convulsions or paralysis; the surface flushed and hot; breathing either rapid or shallow; or labored and slow.

Diagnosis.—It is of great importance to distinguish at once between attacks of sunstroke and heat exhaustion. Cases of sunstroke are to be differentiated from alcoholic insensibility, for which purpose the clinical thermometer is indispensable.

Attacks of heat exhaustion, if properly treated, make favorable recovery. The prognosis of sunstroke is unfavorable in the majority of cases. Unfavorable indications are increased temperature, convulsions, followed by complete muscular relaxation. Favorable indications are decline in surface heat and return of consciousness.

Treatment.—Cases of heat exhaustion should be treated by placing the patient in a recumbent position with the head low and by the use of stimulants. For sunstroke, the indications for treatment are the very opposite. The patient is in imminent danger from the extraordinary temperature, and measures to reduce it must at once be instituted. Of these none gives such excellent results as the rubbing with ice or the cold bath or cold pack. The wrapping of the patient in a wet sheet, if consciousness has not been regained, should be tried.

LIGHTNING STROKE.

Instantaneous death or only temporary unconsciousness may result. Sometimes superficial or deep burns or paralysis of special nerves or those of sensation and motion may be occasioned.

Treatment.—The application of external warmth, artificial respiration, and stimulants are indicated. The wounds must be treated as ordinary burns.

FROSTBITE.

This term is used to designate the local results of cold. The depressing effect of cold upon the local circulation of the part is such that this

ceases and the part may be actually frozen. With due care the vitality may yet be restored, but even when actual freezing of the part has not occurred, unskillful treatment will result in gangrene.

Symptoms.—At first numbness and tingling, then loss of power, usually commencing in the fingers and toes, and a sense of weight are complained of; finally, absolute loss of sensation is noted, and the parts are bleached white and are icy cold to the touch. Those parts which are hopelessly frozen, at first white, are then cold and insensible, and after reaction either become swollen or discolored, or may shrivel up and contract. Gangrene does not usually set in for some little time, it being not unusual for the part to look quite well for some days, then to become discolored, bluish, dark blue, and finally black.

Treatment.—The result to be dreaded is the partial or total death of tissues which would necessitate amputation of the part or parts. Restore the circulation by gently rubbing them with snow or applying friction while they are immersed in ice water. This must be done in a room of low temperature, the heat of an ordinary bed having been known to cause serious trouble. As soon as the general body temperature has returned to the member, stimulating friction with soap liniment or alcohol will produce excellent results. Then cover the part with cotton. Stimulants and warm drink can then be given with caution.

VERTIGO.

Synonym.—Dizziness.

Definition.—Vertigo or dizziness is a subjective state in which the individual affected, or the objects about him, seem to be in rapid motion, either of a rotary, circular, or a to-and-fro character.

Gastric or stomach vertigo is the most common variety, and results from either dyspepsia or constipation.

Nervous vertigo is associated with sick or nervous headache and is caused by physical or nervous excesses, and also by the immoderate use of tea, coffee, alcohol, and tobacco.

Symptoms.—In all varieties of vertigo the symptom of a sensation of objects moving around the patient or the patient moving around objects which remain stationary, is present in some degree. The attack of giddiness comes on suddenly, with an indistinctness of vision and slight confusion of thoughts. The patient may fall unless he grasps something to steady himself. Nausea and vomiting with ringing of the ears are often associated with the vertiginous sensations. There is no loss of consciousness.

The attack is sometimes the result of reading, writing, sewing, or other close application of the eyes; the ordinary symptoms of vertigo being preceded by headache, nausea, specks before the eyes, and pain in the eyeballs.

The attack of aggravated vertigo is so sudden and overwhelming at times that a person is suddenly thrown to the ground as if struck with a blow.

Treatment.—Place the patient in a dark room in a recumbent position. Put hot applications over the eyes and treat exclusively with a milk diet. If the bowels are constipated, a large dose of castor oil will be of benefit. In vertigo the habits of the patient must be abstemious, excluding tobacco, tea, coffee, and highly seasoned foods, malt liquors and alcohol

INJURIES OF THE HEAD.

Injuries of the head are peculiarly important from the fact that they may not be limited to the external soft parts and the bones, but may involve the brain, the great nervous center, on the integrity of which life itself depends. The brain is well protected against ordinary injuries or moderate violence. Not only is the head covered with the dense, fibrous scalp, but the brain is further incased and defended by the hard, bony skull, which is practically a closed box, the thickness of which varies in different persons and in different regions. This bony case is arched on its upper surface so that blows which would otherwise fracture and penetrate the skull glance from this curved surface and do but little harm. Moreover, the bones are distinctly resilient and elastic, yielding under a blow, but springing back to their former position without fracture, unless the violence be too great. Its elasticity, of course, diminishes from youth to age. It is made up also of a number of bones united edgewise at the sutures, which, to some extent, diminish the violence inflicted upon the skull, although a fracture often crosses the sutures. Moreover, a blow of sufficient violence may produce a fracture either at the point where it is inflicted, or, occasionally, though rarely, at a point opposite to that at which the blow is received. This last form of fracture is called fracture by contrecoup, or counterstroke. It should be observed that injury by counterstroke is much more frequent in the brain than in the skull. There are a number of instances on record where a blow received on one side of the head has produced laceration of the brain, and even of the middle meningeal artery, on the opposite side.

Inside of this bony case lies the brain surrounded by its membranes and more or less steadied and protected by a small fluid normally existing in the skull, both on the outside of the convulations and in the ventricles themselves. Nevertheless, the brain must be looked upon as a soft mass of tissue more or less easily lacerated by commotion or shaking from blows and falls, even without any fracture of the bones.

Both the brain and its membranes are subject to inflammation, which is followed by irritation and later by exudation, swelling, and pressure, and the exudate cannot escape through the thick skull and scalp except a means of exit be offered by the surgeon. Hence the frequent need for trephining. The pressure of this exudate may be relieved to some extent by the escape of some of the intracranial blood and of some of the cerebro-spinal fluid into the spinal canal; but if the pressure increases, the functions of the brain must be interfered with and become altered or even abolished, while the irritation may cause an exaltation of function. This alteration or abolition may apply to the intellectual, the sensory, or the motor functions of the brain, so that there may be mania or coma, hyperesthesia or anesthesia, and spasm or paresis or paralysis. If there is gradually increasing pressure, as from a slowly-growing tumor, the brain may accommodate itself to it even for some years; but sudden pressure, as from a fracture or a clot of blood, always produces serious symptoms at once.

Moreover, the interference with function may be general, or, if the pressure be local, the alteration or abolition of function will be local, at least at the beginning, so that there will be paresis or paralysis of an arm or leg or of half the face; alteration or abolition of speech, either sensory or motor; and, if there be inflammation of, or pressure on, the optic nerves or tracts, optic neuritis will develop. Sometimes the alteration will be obscure and functional rather than organic, so far as we can discover, and will produce headache, epilepsy, or insanity, without any perceptible change in the brain substance. When pressure is produced by a blood clot, caused by a blow with or without fracture, and followed not uncommonly by a cyst, epilepsy is not an infrequent sequel. It seems also to be probable that the scar resulting from laceration of the brain tissue, even in simple fracture or contusion, may be followed by epilepsy.

While the general anatomical facts here stated have been of course long known, yet the localization of function in various parts of the brain has been proved and accepted only in the last thirty years, while cerebral surgery founded upon it practically began only in 1884. Broca in France; Goltz, Fritsch, and Hitzog in Germany; and Horsley in England,

have done the principal work in solving the neurological problem, while Macewen and Horsley in England have created a new department in surgery. Until a few years ago the skull was regarded as a region so dangerous that Dante's motto might have been an appropriate warning. "Abandon hope, all ye who enter here;" and though there were occasional accounts of extraordinary and unexpected recoveries from accident, yet purposeful interference with the brain and its membranes was never to be thought of except where compound fracture with serious brain symptoms made it absolutely needful, and then it was undertaken with reluctance and fear. This was due, first, to our ignorance of the localizing value of the different parts of the brain, which differ from one another in function as much as do the different viscera of the abdomen; and, secondly, to our ignorance of the fact, now amply proved, that if we employ the rigid antiseptic details practised by Macewen and fully formulated by Horsley so late as 1886 and 1887, we can invade the skull cavity with far less danger than was formerly thought possible. Inflammation and suppuration should rarely follow, provided antiseptic precautions are strictly followed.

APPARENT DEATH FROM DROWNING, STRANGULATION, OR SUFFOCATION.

Act quickly and persevere for hours, if necessary.

Do not waste time by removing the patient unless the weather is severe and inclement.

Send by the quickest means for medical assistance, clothing, blankets, and supplies.

Place the patient face downwards, forehead resting on bent arm for protection.

Pull the tongue forward, using forceps or fingers for the purpose.

Let any fluids flow from the mouth and throat.

See that in handling the body the tongue does not fall back so as to close up the passage of the throat and prevent the entrance of air into the lungs.

Try to excite breathing by:—

Turning the patient to one side.

Apply a pinch of snuff to the nostrils, or use other convenient methods of exciting sneezing.

Rub the face until it becomes warm.

Then dash cold water in the face.

If this is not successful, try artificial respiration.

Sylvester's Method.

Clear the throat of all mucus, etc.

Hold the tongue forward in the mouth,—an assistant can do this.

Use a handkerchief in holding the tongue to prevent slipping back.

Lay the patient out straight on his back on a level surface.

Loosen the clothing around the chest and abdomen.

Put a folded coat under the head so as to raise it slightly.

Kneel or stand, according to situation, at the patient's head.

Bend the arms tightly at the elbows.

Grasp the forearm near the elbows.

Firmly press the elbows against the lower part of the chest for three or four seconds. See Fig. 102.

Sweep the patient's arms at full length outward and upward alongside of the head until the hands touch. See Fig. 103.

Pull firmly up on the arms so as to expand the chest for a few seconds.

Restore the bent arms to the first position and press again upon the walls of the chest for a few seconds.

You are thus imitating the rising and falling of the chest as it occurs in natural breathing.

Repeat at the rate of about twelve or fifteen times a minute, until natural respiration recommences.

Continue after breathing begins and give the process such assistance as it requires until it goes on easily.

When one operator gets tired have another take his place without interruption.

It may be necessary to keep up the method for two hours or longer.

Meanwhile let another assistant apply dry warmth by such means as hot blankets to the body.

Rub the surface of the body briskly.

Rub the limbs upward, not downward, using a towel if at hand, if not, a handkerchief or the hand.

Put dry clothing around the patient in drowning cases, letting bystanders contribute coats and waistcoats for the purpose.

The first signs of returning life are usually a sigh, or a gasp, a slight movement or palpitation of the heart.

Do not relax the efforts on the first signs of returning life. Rather

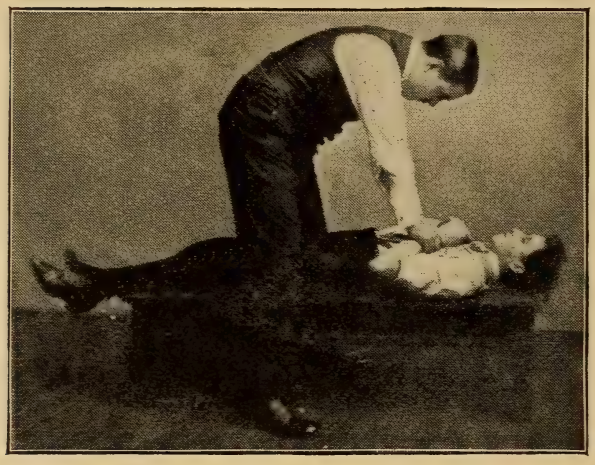

Fig. 102. Artificial Respiration.
Position I. Sylvester's Method.

Fig. 103. Artificial Respiration.
Position II. Sylvester's Method.

redouble the efforts. Many a life has been sacrificed by relinquishing the efforts just at this point.

As soon as the patient can swallow give a teaspoonful or two of warm wine or brandy and water. Do not give him raw liquor as it may cause choking.

When revived, place the patient in a bed, well supplied with warm blankets.

Keep him perfectly quiet and resting as much as possible.

Method When the Arm is Broken or Injured.—The method of exciting respiration by artificial means just described cannot be practised when the arm is broken, dislocated, or otherwise injured. In such cases do not take time to set the limb, reduce the dislocation or bandage a wound, unless there is hemorrhage.

Proceed at once as follows:—

Strip the patient from the neck to the waist.

Place him flat on his back.

Raise the chest somewhat by putting a rolled-up coat under his shoulders.

Stand astride of the patient, facing his head.

Press upon the body along the lower or floating ribs, where the chest can be most easily compressed.

Keep the fingers spread well apart, so as to cover as much area as possible.

Squeeze together the two sides of the chest.

The pressure must be very considerable; but care must be taken that no injury is done to the parts.

A rib may be broken by exercising too great force; and the thumb may be too strongly pressed into the region of the stomach or abdomen.

Maintain the position shown in Fig. 104 for two seconds.

Then, with a quick, springing motion, remove all pressure, taking the hands completely from the body.

Where the arms are not injured, they may be grasped and raised upwards and downwards at right angles to the body so as to bring about the alternate contraction and expansion of the chest. This method, which is rather less effective than the others, is shown in Fig. 105.

There are many other methods, but they require more or less skill to perform them correctly. Those given above are the simplest and at the same time most likely, if persisted in, to bring about beneficial results at the hands of an unskilled person.

FIG. 104. ARTIFICIAL RESPIRATION.
Compressing the chest. Howard's Method.

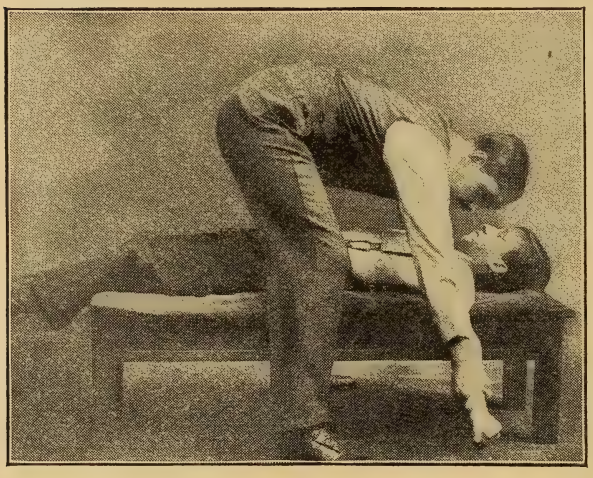

FIG. 105. ARTIFICIAL RESPIRATION.
Raising and lowering arms. Third Method.

POISONS AND THEIR ANTIDOTES.

In treating cases of poison remember the following points:—

First.—Send immediately for a physician.

Second.—Wash out the stomach, or produce vomiting.

Third.—Give the proper antidote after the stomach has been washed out.

Fourth.—A prompt cathartic (Epsom salts, castor oil, olive oil, sweet oil) to eliminate the poison from the bowels.

Fifth.—Treat dangerous symptoms, if any arise as a result of the poison.

Sixth.—If the heart fails give stimulants.

Seventh.—If respiration is embarrassed douche the chest alternately with hot and cold water. Perform artificial respiration.

To empty the stomach, any long rubber tube, to one end of which a funnel may be attached while the other end slightly oiled is passed through the mouth into the stomach, will serve as a stomach tube. Holding the funnel above the mouth, warm water or strong mustard water may be poured through the funnel and tube into the stomach. Then, by lowering the funnel end to below the level of the stomach and moving the tube up and down a few times, the stomach will become so irritated as to throw out the water and some of the poison. Raise the funnel end and pour in warm water; lower the tube as before. Repeat this process until the fluid from the stomach returns perfectly clear. If a tube is not at hand, produce vomiting as speedily as possible by repeatedly drinking warm water, or strong mustard water, or by tickling the throat with the finger or a feather.

IRRITANT POISONS

Are arsenic, antimony, mercury, iodine, chlorine, ammonia, cantharides, alkalies, and strong acids—cause intense burning pain in throat and stomach. Vomiting *must* be produced. After the stomach has been evacuated of a poison, take oil, or whites of several eggs, flaxseed tea, slippery elm tea, gum arabic in solution, or gelatine.

NARCOTIC POISONS

Are opium, chloral, alcohol, belladonna, aconite, strychnia, carbolic acid—produce deep sleep and insensibility, which must be counteracted by shocks to the nervous system by dashing *cold* water on the spine and

chest, also administer strong coffee and other stimulants. Keep patient awake and moving at any cost.

EMETICS TO BE USED IN CASES OF POISONING.

1. Copious draughts of warm water.

2. A tablespoonful of mustard in a glass of warm water; repeat until effective.

3. Sulphate of zinc: twenty or thirty grains in half a glass of warm water. Repeat every fifteen minutes until effective. Do not give it if salt and water has been given.

4. Sulphate of copper: five to seven grains in one quarter glass of water. Not to be repeated. This emetic should be used only in cases of phosphorus poisoning and then with caution.

5. Alum: a heaping teaspoonful for a child, a tablespoonful for an adult, given in a little water.

6. Turpeth mineral: The dose for a child one to two grains, repeated, if necessary, in fifteen minutes. Dose for an adult two to five grains in a little warm water. If five grains are given without effect, do not repeat the dose, but try other emetics.

7. Ipecac: Is inferior to other emetics but may of necessity be used. Syrup of ipecac or wine of ipecac in from one-half to one teaspoonful dose is the emetic for an infant. The fluid extract of ipecac, thirty or forty drops, the emetic for an adult. Fifteen to thirty grains of the powder is given in half a glass of warm water.

The Heart Stimulants to be employed are brandy, whisky, strychnia, one-sixteenth to one-thirtieth of a grain; or tincture of digitalis, 20-drop doses by the mouth; aromatic spirits of ammonia, one teaspoonful dosage in water; ammonium carbonate, two to ten grains in water; strong, hot coffee.

Respiratory Stimulants are strychnia sulphate, one-sixtieth to one-thirtieth of a grain in water hypodermically or by the mouth; ammonium carbonate, two to ten grains in water; sulphate of atropine, one-hundred-fiftieth to one-seventy-fifth of a grain in water hypodermically, or by the mouth.

Emollients and Demulcents are used to protect the mucous membranes. They are flaxseed or linseed oil, olive oil, flaxseed or linseed tea, almond oil, licorice, glycerine, starch paste, vaseline, whites of eggs.

Acetanilid.—Emetics, recumbent position, rest, stimulants by the stomach, hypodermic injection, or by the rectum.

Acids (Mineral Acids).—Do not give emetics. Neutralize the poison with soapsuds, washing soda, chalk, magnesia, plaster of the wall in emergency, then cautiously wash out the stomach and afterwards give emollient drinks such as oils, milk, whites of eggs, to protect the mucous membranes. Stimulants to overcome depression, and morphine, one-eighth to one-quarter grain, or twenty drops of laudanum, to relieve pain. If acid is in the lungs, let the patient inhale fumes of ammonia.

Acid, Carbolic.—Any soluble sulphate such as Epsom salts, one to three ounces, or Glauber's salts; alcohol, two to six ounces in any form, except wood alcohol, to neutralize the acid. Then produce vomiting. White of egg; olive oil, two to four ounces, in one pint of water.

Acid, Hydrocyanic.—Emetics; then give twenty grains of carbonate of potash in an ounce of water followed immediately by a mixture of ten grains of copperas (sulphate of iron) and one teaspoonful of tincture of iron in an ounce of water. Douche to the face and chest with cold water. Fresh air, inhalations of ammonia, artificial respiration, stimulants, artificial heat.

Aconite.—Emetics, recumbent position, mustard over the heart, stimulants; rub the patient vigorously, apply external heat, give demulcents, artificial respiration.

Ammonia.—Do not use stomach tube, for fear of perforating the stomach; produce vomiting by other means. Give vinegar, lemon juice, and demulcent drinks to protect the mucous membranes. If the patient is overcome by inhalation of the gas, let him smell hydrochloric acid or acetic acid. Relieve pain by one-eighth to one-fourth grain of morphine, or twenty drops of laudanum.

Antimony.—Produce vomiting, give strong tea, tannic or gallic acid or catechu as an antidote. Demulcent drinks, to protect the mucous membranes. Morphine, one-eighth to one-fourth grain, or twenty drops of laudanum, to relieve pain. Stimulants, warm blankets, and hot water bottles.

Antipyrine.—Treat as for acetanilid poisoning.

Arsenic.—Prompt vomiting; then give arsenic antidote to be found in drug stores as "Hydrated Oxide of Iron, with Magnesia." Demulcent drinks; purgatives, preferably castor oil; morphine, one-eighth to one-quarter grain, or twenty drops of laudanum, to relieve pain. Stimulate and apply artificial heat. Large quantities of tepid, greasy, or soapy water; dishwater or salt and water; one-half pint of olive oil in one pint of limewater; linseed meal poultices to the abdomen.

Atropine.—Treat as for belladonna poisoning.

Barium Salts.—Treat as for poisoning by lead salts.

Belladonna.—Emetics, given in strong tea; apply cold to the head; give enema of strong, hot coffee. Sweet spirits of niter in teaspoonful dosage to eliminate the poison. Morphine, one-fourth grain dose, or twenty drops of laudanum, to antidote the poison and relieve pain. Perform artificial respiration; give inhalations of ammonia; apply artificial heat.

Bee Sting.—See "Sting of Bees."

Cantharides (Spanish Fly).—Emetics, copious demulcent drinks, such as gruel, flaxseed tea, elm bark tea, barley or rice water. Do not give oils. Large draughts of water to flush the kidneys. Morphine, one-eighth to one-quarter grain, or twenty drops of laudanum, to relieve pain. Stimulants; artificial heat.

Chloral.—Emetics; strong coffee in quantity; strychnia, one-thirtieth of a grain, and atropine, one-hundredth of a grain, as antidotes. Apply electricity; slap the patient with a wet towel or palm of the hand. Shake him vigorously to keep him awake. Perform artificial respiration; apply cold to the head, and give inhalations of ammonia.

Chloroform.—If inhaled to excess, lower head and pull tongue forward to admit plenty of fresh air; perform artificial respiration. If swallowed, empty the stomach either with tube or emetic. Give baking soda solution—tablespoonful to tumblerful of water. Repeat two or three times. Douche chest with hot and cold water alternately. Stimulate. Inhalations of ammonia, perform artificial respiration; supply artificial heat.

Coal Gas and Choke Damp.—Open the windows; supply plenty of fresh air; perform artificial respiration; douche the chest with hot and cold water alternately; cold effusions to the face; stimulate; slap the chest over the heart with the palm of the hand; give inhalations of ammonia.

Cocaine.—Give emetic; give tannic or gallic acid, twenty grains in one-quarter glass of water, then, wash out the stomach or give emetic again. Stimulate; perform artificial respiration; give inhalations of ammonia.

Codeine.—Treat as for opium poisoning.

Colchicum.—Give emetics and cathartics; follow by demulcent drinks; give inhalations of ammonia; morphine, one-eighth to one-fourth grain; or twenty drops of laudanum. Keep up external heat to abdomen and extremities.

Conium.—Give emetics; follow by strong tea, tannic or gallic acid (twenty grains in a little water), and again give emetic. Next, give plenty of demulcents and stimulate. Perform artificial respiration.

Copper Sulphate.—If a copper coin is swallowed avoid liquids, give constipating foods (dry diet) and it will pass the bowels without serious injury. If copper in other forms is swallowed (as salts of copper), give emetics, whites of eggs in water or milk and the ferro-cyanide of potassium (fifteen grains in a glass of water), or soapsuds may be given and wash out the stomach again. Relieve pain with morphine, one-eighth to one-fourth grain, or twenty drops of laudanum; ultimately give ten or fifteen grains of iodide of potash in water every three hours until symptoms of cold in the head appear.

Corrosive Sublimate (Bichloride of Mercury).—Treat as for copper poisoning.

Creosote.—Treat as for carbolic acid poisoning.

Croton Oil.—Give emetics; wash out the stomach; give demulcent and emollient drinks; morphia, one-eighth to one-fourth grain, or twenty drops of laudanum, to relieve pain and arrest bowel movements.

Cyanide of Potash.—Treat as for hydrocyanic acid poisoning.

Digitalis.—Give emetics; then tannic or gallic acid (twenty or thirty grains in a little water), or draughts of strong tea, and wash out the stomach again. Tincture of aconite in two or three drop dosage (not to be repeated), or laudanum, twenty drop dosage, if the patient has been accustomed to the use of digitalis; stimulate; keep the patient in the recumbent position, for fear of heart failure.

Elaterium.—Treat as for colchicum poisoning.

Ergot.—Give emetics; follow by tannic or gallic acid (twenty grain dosage in a little water), or oak bark decoction; stimulate and give nitroglycerine, one-hundredth of one grain, as an antidote. Supply artificial heat and rub the patient briskly.

Ether.—Treat as for chloroform poisoning.

Fly Poison.—Treat as for arsenic poisoning.

Fish Poisoning (Ptomaine Poisoning—poisoning from milk, cream, or ice cream).—Give emetics; followed by gallic or tannic acid (twenty grain dosage in a little water), and again give emetic. To control pain and diarrhœa, give morphia, one-eighth to one-fourth grain, or twenty drops of laudanum, adding to either of these fifteen or twenty drops of tincture of capsicum or a few grains of red pepper. Bathe with alcohol and tepid water (equal parts) to reduce fever. Sweet spirits of niter in one teaspoonful dosage every three hours

to relieve the kidneys. To overcome the nausea and vomiting, after the stomach has been thoroughly washed out give bismuth subnitrate, ten grains in one teaspoonful cinnamon water. Repeat every two hours.

Gold.—Treat as for copper poisoning.

Hyoscyamus.—Treat as for belladonna poisoning.

Insect Bites.—Treat as for sting of bees.

Ink; Aniline Dyes.—Treat as for acetanilid poisoning.

Iodine.—Give emetics, demulcent drinks, starch or flour water. Relieve pain with morphia, one-eighth to one-fourth grain dosage, or twenty drops of laudanum. Inhalations of ammonia. Supply artificial heat.

Laudanum.—Treat as for opium poisoning.

Lead Salts.—Give emetics, followed by dilute sulphuric acid, thirty drops, or tablespoonful of Epsom salts or Glauber's salts in water, and again give emetics. Give demulcent or emollient drinks, following with morphia, one-eighth to one-fourth grain dosage, or twenty drops of laudanum in water, to control pain. Supply artificial heat, particularly over the bowels. In cases of chronic lead poisoning, put the patient on iodide of potash, iodide of lime, or iodide of soda, fifteen to twenty grain doses three times daily, to promote elimination.

Lobelia.—Give emetics; then tannic or gallic acid (twenty or thirty grains in water); then again wash out stomach. Stimulate with strychnia and alcohol; give cathartic, preferably castor oil; relieve pain with morphia, one-eighth to one-fourth grain, or twenty drops of laudanum.

Matches.—Treat as for phosphorus poisoning.

Morphine.—Treat as for opium poisoning.

Mushrooms.—Give emetic; purge with castor oil; and wash out the bowels with warm soapsuds injection. Give atropine, one hundredth of a grain hypodermically, or tincture of belladonna, twenty drops in water, every half hour by the mouth, until relieved or until dryness of the throat is produced. Stimulate and supply artificial heat.

Mercury.—Treat as for copper poisoning.

Nicotine.—Treat as for tobacco poisoning.

Nitrous Oxide (Laughing Gas).—Treat as for chloroform poisoning.

Nux Vomica.—Give emetic, and wash out the stomach repeatedly. Give tannic or gallic acid (twenty grain dosage in water); strong tea or decoction of oak bark; and wash out the stomach again. Draw off the urine through a catheter. Give sweet spirits of niter in teaspoonful

dosage every three hours. To control spasms, give thirty grains of chloral and sixty grains of bromide of potash in water or milk, and give inhalations of chloroform or ether. Perform artificial respiration.

Opium.—Give emetics; then tannic or gallic acid (twenty or thirty grains in water), or large draughts of strong tea, and again give emetics; perform artificial respiration; apply cold water to face and chest. Give atropine one-hundred-twentieth grain hypodermically, every fifteen minutes for three doses; strychnia, one-thirtieth grain; and strong, hot tea or coffee should be given. Give cathartic; draw off the urine frequently. Keep the patient awake by applications of electricity.

Oxalic Acid.—Wash out the stomach; give limewater, chalk, carbonate or oxide of magnesia to neutralize the acid. Wash out the bowels; give water by the mouth freely. Apply artificial heat.

Paris Green.—Treat as for arsenic poisoning.

Phosphorus (Rat Poison).—Give emetics, such as copper sulphate, five grains in a little water every five or six minutes until effective. Wash out the stomach with oil of turpentine, one teaspoonful to a pint of water; give limewater to overcome the action of the poison. Draw off the urine frequently. Act upon the bowels and kidneys by giving two tablespoonfuls of Epsom salts in a glass of water, to which add a teaspoonful of sweet spirits of niter. Give neither oils nor fats as phosphorus is soluble in them.

Poison Ivy.—An external poisoning due to contact with the poison ivy vine. Cover the parts with ichthyol and vaseline (equal parts), or use saturated solution of lead acetate in dilute alcohol, and rub well over affected parts for several days; or, use acetozone, fifteen grains dissolved in a quart of warm water. Let stand for two hours. Then apply to affected parts cloths wet with this solution, and keep the cloths constantly wet. Whatever local treatment is employed, it must be continued for some days. Keep up nutrition; relieve the nervous irritability by administration of strong coffee and strychnia, one-thirtieth of a grain, every four hours for an adult.

Rat Poison.—Usually contains arsenic and phosphorus and the treatment should be that for arsenic and phosphorus poisoning.

Silver Compound.—Give emetic, and wash out the stomach with strong brine (two teaspoonfuls of common salt to one pint of warm water). Give plain water freely; whites of eggs; milk; demulcent drinks. Relieve pain with morphia, one-eighth to one-fourth grain, or twenty drop dosage of laudanum.

Snake Bite.—Suck the wound clean as possible, or cause it to bleed

freely, and apply strong ammonia; or, inject permanganate of potash solution (ten grains to a pint of water). Stimulate; give inhalations of ammonia and aromatic spirits of ammonia in teaspoonful dosage internally. Perform artificial respiration, if required.

Soda.—Treat as for ammonia poisoning.

Stings of Bees, Insect Bites, etc.—Extract the sting; apply onion poultice or raw onion or ammonia water; baking soda or the following:—

Turpentine, ... 1 ounce.
Sal Ammoniac, ... 2 drams.
Compound Soap Liniment, to make, ... 5 ounces.

Mix, and apply locally.

Stramonium (Thorn Apple).—Treat as for belladonna poisoning.

Sulfonal.—Treat as for chloral poisoning.

Strychnine.—Treat as for nux vomica poisoning.

Tartar Emetic.—Treat as for antimony poisoning.

Thorn Apple.—Treat as for belladonna poisoning.

Tobacco.—Give emetics, followed by tannic acid (thirty grains in a little water), and wash out the stomach with warm water. Stimulate; give water freely, and sweet spirits of niter in teaspoonful dosage every three hours. Keep the patient quiet in a recumbent position; apply artificial heat to the body and lower extremities, and cold to the head.

Vitriol (Blue).—Treat as for copper sulphate.

Vitriol (White).—Treat as for zinc salts.

White Precipitate.—Treat as for copper sulphate poisoning.

Wood Alcohol.—Treat as for alcohol poisoning.

Zinc Salts.—Give emetic, or wash out the stomach with baking soda or washing soda (four drams to a pint of water). Give tannic acid or gallic acid (twenty or thirty grains to a wineglass of water), and wash out the stomach with warm water. Then give warm demulcent or emollient drinks; relieve pain with morphia, one-eighth to one-fourth grain, or twenty drops of laudanum. Apply external heat, particularly over the bowels and lower extremities.

POISONOUS PLANTS OF WOOD, FIELD, AND GARDEN.

It is remarkable that in view of the very large number of painful and fatal cases of poisoning by plants that occur every year in this country, no attempt has been made to place accurate and full information on the subject within the reach of the public.

Ignorance concerning the poisonous plants causes loss of human life, destruction of whole herds of cattle, enormous financial loss, and much suffering and distress from innumerable cases not attended by fatal results.

It is found by inquiry and study of the subject that a great deal of what is considered accurate knowledge on the subject is very imperfect; much of it is traditional; many plants which are perfectly harmless are supposed by many to be extremely dangerous; and some that are eminently dangerous are not well enough known to be recognized when seen.

The confusing variety of names by which one and the same plant is known in different localities, and the great number of different names given to it in the same locality, only add to the already too great possibility of fatal mistakes.

The danger is also greatly increased by the fact that many persons are very susceptible to the effects of poison in plants, while others enjoy a sort of immunity from it and can handle plants of this sort with perfect safety. So that what is a poisonous plant to one person in a locality is not so regarded by others. The Poison Ivy is, perhaps, one of the commonest examples of this sort. Some are poisoned by it when passing in the vicinity where it grows, without coming in contact with it. Others can handle it with perfect safety.

But the very great harm that such plants do lies in the fact that so many people do not know the dangerous plants when they meet them. The result is that these persons are in a state of constant dread of every unknown plant or they unconsciously expose themselves to danger at every turn. Of what protective advantage is it to one to know that Poison Ivy is a very dangerous and painful plant with which to come in contact if one does not know the plant when one sees it? It is this very ignorance that has caused great suffering to some; while others have rooted out the beautiful and perfectly harmless Virginia Creeper from their yards and gardens with needless and ridiculous fear under the impression that it was the offender. The knowledge that Poison Ivy never has five leaflets would have saved them much anxiety and preserved to them a highly decorative climbing plant.

Common Causes of Poisoning.—Of the very great number of cases of poisoning by plants which have been thoroughly investigated, it is found that the common causes of poisoning by them result from:—

1. An overdose of teas and infusions made from such plants as are used as domestic remedies.

2. Mistaken identity, such as using aconite seeds for anise seeds; aconite leaves for parsley; and aconite root for horse-radish.

3. The attractiveness and beauty of flowers, berries, leaves and roots; such as caused the death of four children recently in New York city by eating the seeds of a Jimson Weed, which they found growing in a vacant lot.

4. Children making whistles from the hollow stem of the Wild Parsnip and taking that part of the plant into the mouth while blowing upon it.

5. Curiosity; such as caused one man to nibble upon the root of the Oregon Water Hemlock, with fatal results.

Protective Measures.—The two very simple means which self-defense and parental care suggest are to learn to know the dangerous plants with positive certainty and then to eradicate them. To this end are presented very accurate drawings of the several plants from life, simple and clear descriptions of them in plain language, and particulars of the poisonous effects, with proper treatment.

The law of England holds a person responsible for any damage (even in trespass) which follows from the possession or cultivation of poisonous plants. For instance, a jury awarded damages recently to the owner of a horse which was poisoned by eating of the branches of a yew tree which hung over the fence of an adjoining yard.

In New York the directors of a cemetery were compelled to pay $3,500 damages as a result of poisoning by poison ivy, which had been allowed to grow within the grounds.

Some states, such as Colorado, are paying large bounties for the extermination of the loco weed, which is so destructive to animals in the West. Between the years 1881 and 1885, Colorado paid out over $200,000 as bounties.

There are many instances of legal complications which confront legislators who attempt to deal with the matter. That there are hardships against the enactment of a stringent law of responsibility is very plain. Yet, on the other hand, when one remembers the tremendous loss of life and property resulting from the cultivation of such plants, one is almost inclined to forget the lesser hardship.

FLY AMANITA.

Botanical Name.—Amanita Muscaria (*L.*) Fr.

Common Names.—Fly fungus, fly agaric; fly killer, deadly amanita; false orange amanita.

Habitat.—Found in pine and oak forests from spring to autumn. Abundant in many localities throughout the United States.

Description.—From four to sixteen inches high; when young, the cap is convex on top; later, it becomes flat or even concave; cap covered with warts; in color it ranges from white through all shades of yellow to a bright red; the gills under the cap are white.

Poisonous Parts of the Plant.—An alkaloid called muscarine present in all parts of the plant. An effective fly poison.

Causes of Poisoning.—Plant is mistaken for edible mushroom.

FIG. 106. FLY AMANITA (AMANITA MUSCARIA). ONE-FOURTH NATURAL SIZE.

Symptoms of Poisoning.—Heart's action is slow; breathing is difficult; profound stupor; cold sweats; giddiness; double vision; lock-jaw; death ensues in from eighteen hours to two or three days.

Treatment.—Heart's action is to be increased and sustained by hypodermic injections of from 1-100 to 1-50 of a grain of atropine. Mustard is the best emetic; if this fails, give hypodermic injections of apomorphine. Two grains of permanganate of potash in a one per cent alkaline solution may be given to decompose the poison; follow it with olive oil, and an enema of warm water and turpentine.

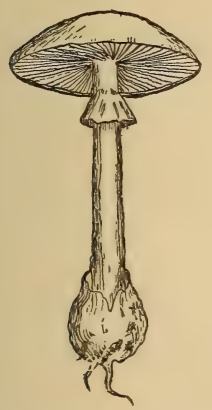

FIG. 107. DEATH CUP (AMANITA PHALLOIDES). ONE-FOURTH NATURAL SIZE.

DEATH CUP.

Botanical Name.—Amanita Phalloides.

Common Names.—Poison amanita; bulbous amanita.

Habitat.—Found abundantly in pine forests, also on edges of woods in Eastern and Middle States, California, and Washington, D. C.

Description.—From three to six or eight inches high; cap is smooth and satiny; convex at first, later, flat or slightly concave; white or straw yellow, green, light brown, yellow, or spotted; stem white and nearly smooth; gills are white, and base is bulb-like.

Poisonous Parts of Plant.—The most poisonous of all the fungi. Phallin or toxalbumin, an alkaloid found in all parts of the plant.

Symptoms.—From nine to fourteen hours after eating there are pains; cramp in the legs, convulsions, lockjaw, pupils dilated; nausea; vomiting; "rice water" diarrhœa; and, usually, death in from two to four days.

FIG. 108. FALSE HELLEBORE (VERATRUM VIRIDE). ONE-THIRD NATURAL SIZE.

Treatment.—There is no known antidote for phallin. Empty the stomach and bowels, give hypodermic injection of atropine and similar treatment as in poisoning by fly amanita. The last resort is transfusion of the blood with solution of common salt or blood taken direct from some warm-blooded animal.

AMERICAN FALSE HELLEBORE.

Botanical Name.—Veratrum Viride. Ait.

Common Names.—American white hellebore; white hellebore; false hellebore; swamp hellebore; Indian poke; meadow poke; poke root; Indian uncus; puppet root; earth gall; crow poison; devil's bite; duck retter; itch weed; bugbane; wolfbane; bear corn.

Habitat.—Abundant in wet meadows and along mountain brooks; found very generally throughout the United States.

Description.—From two to seven feet high; large, stemless leaves; fleshy root from one to three inches long; yellowish green, small flowers occurring from May to July.

Poisonous Parts of the Plant.—Several alkaloids, such as jervine,

LADY'S SLIPPER (Cypripedium hirsutum).

cevadine, and veratrine, are found in the rhizome or fleshy root. The plant has been mistaken for marsh marigold and used as food with fatal results.

Symptoms.—Burning pain in the mouth and throat; flow of saliva; retching; vomiting; diarrhœa, headache, dizziness; faintness; low pulse; difficulty in breathing; death ensues from heart paralysis.

Treatment.—Prompt emetics; stimulants, such as brandy or strong coffee; ether or opium; keep the hands and feet warm, and let the patient lie flat on his back.

FIG. 109. ACONITE (ACONITUM COLUMBIANUM). (*a*) FLOWERING PLANT; (*b*) CAPSULE, BOTH ONE-THIRD NATURAL SIZE.

LADY'S SLIPPERS.

Botanical Names.—Cypripedium reginae, Cypripedium hirsutum, Cypripedium parviflorum.

Common Names.—Showy lady's slipper; whip-poor-will shoes; nerve root; female nervine; larger yellow lady's slipper; yellow moccasin; moccasin flower; nervine; American valerian; yellows; Noah's Ark; yellow umbil; Indian shoe; slipper root; Venus's cup; Venus's shoe; umble; male nervine; monkey flower; smaller yellow lady's slipper.

Habitat.—Peat bogs and swamps from Maine to Minnesota and southward to Georgia and Missouri.

Description.—From one to two feet high; leaves large and parallel-veined; flowers white, striped with purple, or yellow, or yellow and brown in the last two species. Flowers of the first species appear from June to September; those of the latter two, in May or June.

Poisonous Parts of the Plants.—An oil secreted by the glandular hairs which cover the stems and leaves.

Symptoms.—Very similar to those of poisoning by poison ivy.

Treatment.—No specific antidote is known.

ACONITE.

FIG. 110. DWARF LARKSPUR (DELPHINIUM TRICORNE). ONE-THIRD NATURAL SIZE.

Botanical Name.—*Aconitum columbianum.*

Common Names.—Monkshood; friar's cap; wolfsbane; iron hat; storm hat; blue weed.

Habitat.—Moist, open woods; banks of brooks, and on mountain sides. Found very generally over the United States.

Description.—From two to six feet high; single stem; showy blue flowers growing in a terminal cluster.

Poisonous Parts of the Plant.—All parts, but, especially, the seeds and roots.

Symptoms.—Burning sensation at the tip of the tongue; choking or constriction of the throat; breathing becomes slow; a tingling or prickling sensation over the body; headache; pains in the abdomen.

Treatment.—Atropine, digitalis, and nitrite of amyl in the hands of a physician prove effective. Give emetics and stimulants. Artificial respiration is to be resorted to and, if necessary, maintained for two hours or more. The patient must lie down during the entire treatment.

LARKSPURS.

Botanical Names.—*Delphinium tricorne; Delphinium geyeri; Delphinium menziesii; Delphinium recurvatum; Delphinium trolliifolium.*

Common Names.—Dwarf larkspur; stagger weed; larkspur; purple larkspur; cow poison.

Habitat.—Clayey soil, open woods, prairies, hillsides, moist soil, and shady places.

Description.—There are twenty-five species, with many common characteristics. They are usually erect, with much dissected, or lobed,

leaves and bear a long cluster of showy flowers. These are commonly blue and have a spur-like growth upon them. The plants vary in height from six to twelve inches, as seen in the dwarf larkspur, up to two feet or more. The species are generally found throughout the United States.

Poisonous Parts of the Plants.—The plants are very poisonous to cattle and great loss, especially among sheep, has resulted. The leaf is the most poisonous part.

Treatment. — Emetics and stimulants, followed by artificial respiration. Atropine, digitalis, and nitrite of amyl have produced good effects.

BLACK CHERRY.

Botanical Name.—*Prunus serotina.*

Common Names.—Wild black cherry; wild cherry; rum cherry; whisky cherry.

Habitat.—Forests, woods, and open country very generally throughout the United States.

Description. — A tree from sixty to eighty feet high; bark, thin, reddish-brown, and scaly; leaves, tapering, saw-edged; flowers, small, slightly bitter and astringent, but rather agreeable.

FIG. 111. BLACK CHERRY (PRUNUS SEROTINA). ONE-THIRD NATURAL SIZE.

Poisonous Parts of the Plants. —The wilted leaves generate prussic acid, the deadliest of poisons. Children occasionally die from swallowing the fruit whole or from eating the kernels.

Symptoms.—An odor of prussic acid or bitter almonds on the breath; difficulty in breathing; low pulse; numbness; fright; protruding eyeballs; convulsions; death from lung paralysis.

Treatment.—Death follows rapidly and relief must be promptly afforded. Emetics; wash out the stomach with peroxide of hydrogen; a solution of cobalt nitrate; artificial respiration; oxygen gas, and transfusion of blood.

FIG. 112. KENTUCKY COFFEE TREE (GYMNOCLADUS DIOICA). ONE-THIRD NATURAL SIZE.

KENTUCKY COFFEE TREE.

Botanical Name.—Gymnocladus dioica.

Common Names.—Coffee tree; American coffee bean; Kentucky mahogany; nicker tree; bonduc; chicot.

Habitat.—Rich soil along rivers from Nebraska to Arkansas, through Tennessee, and the region of the Ohio river to Western Pennsylvania.

Description.—A tree from forty to sixty feet high; bark, rough and broken across; leaves, from two to three feet long; flowers, yellow; seed pods, large and woody and containing two or more stony seeds and a mass of pulp somewhat resembling vaseline.

Poisonous Parts of the Plants.—An alkaloid, cytisine, contained in the leaves and the pulp of the fruit. Used with milk as a fly poison.

Treatment.—Emetics, stimulants, strong coffee. Alternate hot and cold douches to the head and chest.

WOOLLY LOCO WEED.

Botanical Name.—Astragalus mollissimus.

Common Names.—Loco weed; crazy weed.

Habitat.—The great plains, Western Texas, New Mexico, South Dakota, Wyoming; most abundant in Colorado, Western Nebraska, and Kansas. On pasture lands of the dry prairies and on rocky hillsides.

Description.—Silvery-white; silky-leaved; eight to twelve inches high; flowers, pea-shaped and purple.

Poisonous Parts of the Plant.—An acid called loco acid in the whole plant. Horses, cattle, and sheep are affected by the plant.

Symptoms.—There are two stages. First, which may endure for several months, is one of mania or hallucination; defective sight; after

FIG. 113. WOOLLY LOCO WEED (ASTRAGALUS MOLLISSIMUS), SHOWING THE WHOLE PLANT. ONE-THIRD NATURAL SIZE.

FIG. 114. STEMLESS LOCO WEED (ARAGALLUS LAMBERTII): (*a*) FLOWERING PLANT, (*b*) SEED PODS; (*c*) CROSS SECTION OF SEED PODS. ALL ONE-THIRD NATURAL SIZE.

the animal acquires a taste for the food, it refuses all other kinds. The second stage is one of emaciation; sunken eyeballs; feeble movements, and the animal dies of starvation in from a few months to one or two years.

Treatment.—Remove the animals from the neighborhood of the plants at once; good food; and the following tonic:—

Powdered Sulphate of Iron,.....1 ounce.
Powdered Gentian Root,.....4 ounces.
Powdered Ammonium Chloride,.....1 ounce.
Powdered Potassium Nitrate,.....1 ounce.

Mix, and give a heaping teaspoonful, or a tablespoonful, according to the size of the animal, in the food three times a day.

The stemless loco weed (*Aragallus lambertii*) is similar in appearance and effects to the woolly loco weed.

RATTLEBOX.

FIG. 115. RATTLEBOX (CROTALARIA SAGITTALIS): (*a*) WHOLE PLANT; (*b*) CROSS SECTION OF POD. BOTH ONE-THIRD NATURAL SIZE.

Botanical Name. — *Crotalaria sagittalis.*

Common Names. — Rattleweed; wild pea.

Habitat. — Low, sandy soils, from the Atlantic to Minnesota and Eastern Kansas; also in New Mexico.

Description.—Three to eighteen inches high; leaves, simple and from one to two inches long; flowers, pea-like and yellow, appearing in July; seed pods, an inch long and nearly black when mature; the walls of the pods are hard and when the seeds are detached give forth a rattling sound.

Poisonous Part of the Plant.—Found in leaves and seeds. Generally affects horses and cattle, and is supposed to be the cause of the "bottom disease."

Symptoms.—Loss of strength and flesh, much the same as caused by the loco weed, which is a closely related plant.

Treatment.—Give the animals a nutritious diet; daily doses of:—

Epsom Salts,.....2 ounces.
Sulphate of Iron,.....2 drams.
Nux Vomica,.....1 dram.

SPURGES.

Botanical Names.—There are two varieties: *Euphorbia lathyris* and *Euphorbia marginata.*

Common Names.—The former is known as garden spurge; myrtle spurge; mole plant; mole weed; mole tree; gopher plant; anti-gopher plant; wild caper; caper bush; wolf's milk; spring wort. The latter is also called snow-on-the-mountain.

FIG. 116. (*a*) CAPER SPURGE (EUPHORBIA LATHYRIS). ONE-THIRD NATURAL SIZE. (*b*) SEED CAPSULE, NATURAL SIZE.

FIG. 117. SNOW-ON-THE-MOUNTAIN (EUPHORBIA MARGINATA). ONE-THIRD NATURAL SIZE.

Habitat.—Caper spurge is a common garden plant. Snow-on-the-mountain is a native of the great plains from Montana to Mexico and is spreading rapidly eastward to Louisiana, Southern Minnesota, Missouri, Wisconsin, Illinois, and Indiana.

Description.—Caper spurge is from two to three feet high; leaves, opposite and four-ranked; flowers, greenish-yellow and small; fruit, conspicuous and three-seeded.

Snow-on-the-mountain is from two to four feet high; leaves, largely margined with white; a much more pleasing plant to the eye.

Poisonous Parts of the Plant.—The milky juice of the caper spurge is highly purgative and poisonous.

Snow-on-the-mountain poisons chiefly by the honey which is made from its flowers.

Symptoms.—Caper spurge juice, when applied to the skin, causes redness, itching, pimples, and sometimes gangrene. The effects last more than a week. The seed when eaten inflames the mouth and stomach and, in sufficient quantities, produces death.

FIG. 118. POISON IVY (RHUS RADICANS). ONE-FOURTH NATURAL SIZE.

FIG. 119. POISON OAK (RHUS DIVERSILOBA). ONE-THIRD NATURAL SIZE.

The honey made from the flowers of snow-on-the-mountain is hot and of a disagreeable taste. It produces vomiting and purging, but its effects are not serious. The juice of this plant acts upon the skin with an effect similar to that of caper spurge, but so severe is it that ranchmen in the West use it in place of hot iron for branding cattle.

Treatment.—Emetics, and give at once milk, white of egg in water, or flaxseed tea; inhale dilute ammonia; excessive purging is corrected by opium; ipecac and veratrum viride have proven of great benefit when

POISON SUMAC
(Rhus vernix).

POISON IVY
(Rhus radicans).

POISON OAK (Rhus diversiloba).

seeds were eaten. When the skin is poisoned, wash with a solution of lead acetate (sugar of lead) in alcohol.

POISON IVY.

Botanical Name.—Rhus radicans.

Common Names.—Poison oak; poison vine; three-leaved ivy; poison creeper; mercury; markry; black mercury; markweed; pickry.

Habitat.—Everywhere in open brush, in ravines, edges of woods, roadsides and fields, abundantly throughout the United States except in California.

Description.—Climbing or trailing plant; leaves, of three leaflets (the Virginia creeper has five). Aerial rootlets; flowers, greenish, appearing in May or June; fruit, smooth and waxy, often seen on the plant late in winter.

POISON OAK.

Botanical Name.—Rhus diversiloba.

Common Names.—Poison ivy; yeara; California poison sumac.

Habitat.—Cool western mountain slopes and ravines, especially on the Pacific coast from Lower California and Arizona to British Columbia.

Description.—Differs from poison ivy especially in the shape of the leaflets. They are thicker, smaller, less sharply lobed, and more nearly elliptical.

FIG. 120. POISON SUMAC (RHUS VERNIX). ONE-FOURTH NATURAL SIZE.

POISON SUMAC.

Botanical Name —Rhus vernix.

Common Names.—Swamp sumac; dogwood; poison elder; poison wood; poison swamp sumac; thunderwood.

Habitat.—Swamps and woods from Florida to Canada and west to Louisiana.

Description.—A shrub from six to thirty feet high; long leaves, of from seven to thirteen leaflets; wood has a slight odor of sulphur, and stems and branches are marked by leaf scars.

Poisonous Parts of the Plants.—All of these produce the same poisonous effects. The poison is due to an oil, called toxicodendrol, which occurs in all parts of the plants. Poison ivy is the poisonous plant of America.

FIG. 121. LILY OF THE VALLEY. ONE-THIRD NATURAL SIZE.

Symptoms.—The oil when it touches the skin, even in very minute quantities, irritates and poisons it. There are itching; swelling; pimples containing a watery secretion; thirst; vomiting; colic; fever and delirium.

Treatment.—Apply the following lotion:—

Grindelia Robusta,.....1 ounce.
Water,.....from 10 to 48 ounces.

Wash the parts frequently. The very best possible application is a solution of lead acetate (sugar of lead) in alcohol.

Frequent washing with soapsuds and hot water is good. This treatment applies to all of these poisonous varieties.

LILY OF THE VALLEY.

Botanical Name.—*Convallaria majalis L.*

Common Names.—May lily; May blossom.

Habitat.—A native of Europe and of the United States. It is seen most frequently in cultivation in gardens. In the wild state it is found in the higher mountains in Virginia, North Carolina, and Tennessee.

Description.—A low-growing plant with two broad, green, conspicuous leaves marked with distinct veins. The flowers are sweet-scented, pretty, bell-shaped, and white. They are borne on a central scape and usually hang to one side. The several parts of the plant are smooth.

Poisonous Parts of the Plant.—All parts of the plant, including the flower, contain a highly poisonous material which chemists call convallamarin. This has a bitter, and, later, a sweetish taste. The leaves

of the plant have a bitter and acrid taste which prevents their being eaten by children. A few cases of poisoning by the several parts of the plant have been recorded.

Symptoms of Poisoning.—Nausea and vomiting; diarrhœa; slow heart action, followed by irregular action of the heart; finally, death from paralysis of the heart.

Treatment.—Place the patient in a horizontal position, which must be maintained for some time after the symptoms subside. Give an emetic, if vomiting has not already occurred; mustard, a tablespoonful to a small cup of water repeated in fifteen minutes. Then give plenty of lukewarm water to facilitate vomiting. Give plenty of good strong tea, or, if tannic acid is at hand, give thirty grains in a cup of water and then another emetic in ten minutes. Then give from one to two tablespoonfuls of Epsom salts in a teacupful of water, followed by plenty of water. Give stimulants of from two to four teaspoonfuls of brandy or whisky in water every one-half to two hours. Keep the body warm, and keep up the circulation by friction.

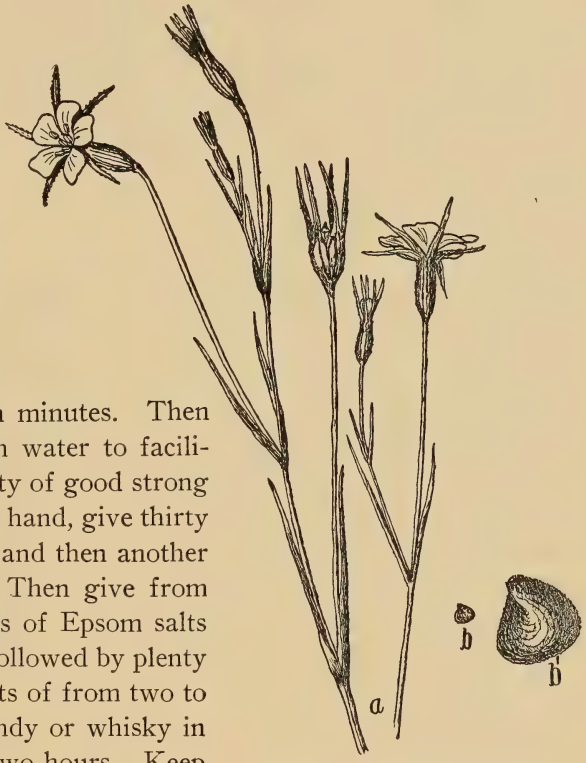

FIG. 122. CORN COCKLE. (*a*) FLOWERS AND SEED VESSELS IN SPRAYS OF PLANT ONE-THIRD NATURAL SIZE; (*b*) SEED OF NATURAL SIZE; (*b'*) SEED MAGNIFIED FOUR TIMES NATURAL SIZE.

CORN COCKLE.

Botanical Name.—Agrostemma githago L.

Common Names.—Cockle; rose campion; bastard nigelle; old maid's pink (in New Hampshire); mullein pink (in New Brunswick and Nova Scotia); licheta (in Vermont); and crown of the field.

Habitat.—A weed in Europe; introduced into the United States with grain seed imported; found in grain fields westward from Maine to North Dakota; southward in Eastern Kansas, Louisiana, and Florida;

rarely found in Wyoming and California; very rare in the dry region eastward from California to Texas and Eastern Kansas.

Description.—From one to three feet high; flowers, violet-red and showy; leaves, long and narrow or grass-like in shape; leaves, stem, and parts of plant whitish and woolly; stem, erect, not trailing; seeds, black, rough, and rather round. The illustration is one-third of the natural size.

Poisonous Parts of the Plant.—All parts of the plant, but especially the kernel of the seed. The poisonous substance is a white powder, called saponin, because when shaken up with water it froths like soap. When inhaled, the powder causes sneezing. It has a sharp burning taste, but has no odor.

Causes of Poisoning.—The seeds of the plants growing in wheat fields become mixed with the grain, and while there is machinery employed in the process of flour-making especially designed to remove these, the process is a very difficult one. In flours of the lower grades, intended by the manufacturers for the feeding of stock, seeds of the corn cockle are often found. These cause poisoning in many of the recorded cases. Poultry running in the fields often eat the seeds and become poisoned. Where the quantity of the poisonous matter in flour is large, the poisoning is acute; where it is small and the flour is regularly eaten, the poisoning is chronic and gives rise to a disease known as "githagism," from the botanical name of the species of the plant, githago.

All black specks in flour should be regarded with careful suspicion, for, while it may not be due to the presence of the ground seeds of this plant, it is at least a sufficient evidence that the process of manufacture is not of the most careful kind, or that the flour is of an inferior grade.

Symptoms of Poisoning.—Intense irritation of the mouth, throat, stomach, and intestines, vomiting, headache, nausea, dizziness, diarrhœa, hot skin, severe pains in the spine; difficulty in walking and moving, and difficult and shallow breathing. In severe cases, coma or insensibility followed by death is present.

Treatment.—The antidote is digitalis, itself a dangerous poison and to be administered only with medical supervision.

Preventive Measures.—The rejection of flour containing black particles of the roughened coat of the seed covering, and the planting of seed wheat in which there are no seeds of the corn cockle. All methods of eradication of the growing plants should be systematically adopted.

RED BUCKEYE.

Botanical Name.—*Æsculus pavia.*

Common Names.—Small buckeye; buckeye; horse-chestnut.

Habitat.—Fertile valleys from Virginia to Florida, the Gulf States to Louisiana, in Arkansas, Missouri, Tennessee, Kentucky, West Virginia, and cultivated in Pennsylvania.

Description.—From eight to twelve feet high; leaves, opposite and long-stemmed; flowers, numerous, bright red, appearing in March; fruit, smooth; seeds, mahogany-colored and highly polished.

FIG. 123. RED BUCKEYE (ÆSCULUS PAVIA). (*a*) FLOWERING BRANCH; (*b*) SEED. BOTH TWO-NINTHS NATURAL SIZE.

FIG. 124. WATER HEMLOCK (CICUTA MACULATA). ONE-HALF NATURAL SIZE.

Poisonous Parts of the Plant.—The young shoots and the seeds contain a poison almost identical with that of the corn cockle. These parts are bruised and stirred into the water of small ponds and brooks to stupefy fish, which are then caught in the hands. Their flesh is not at all tainted by the poison when eaten. The treatment is the same as in corn cockle.

WATER HEMLOCK.

Botanical Name.—Cicuta maculata.

Common Names.—American water hemlock; wild hemlock; spotted hemlock; spotted parsley; snakeweed; beaver poison; musquash root; muskrat weed; cowbane; spotted cowbane; children's bane; death of man.

Habitat.—Swamps and damp soil in the Atlantic States, and west to Louisiana, Iowa, Minnesota, Nebraska, Rocky Mountains, and New Mexico.

Description.—From three to eight feet high; stem, hollow; branches, numerous; leaves, finely dissected; flowers, white; roots, a cluster, spindle-shaped, from one and one-half to three inches long.

FIG. 125. OREGON WATER HEMLOCK (CICUTA VAGANS).

Poisonous Parts of the Plants.—An aromatic, oily fluid, strongest in the root, but also occurring in the rest of the plant. This is one of the most poisonous plants in America.

Symptoms.—Vomiting; colicky pains; staggering; unconsciousness; frightful convulsions, ending in death.

Treatment.—Emetics; purgatives or enemas; chloroform, chloral, and other means of meeting conditions as they arise. There is no known chemical antidote for the poison.

OREGON WATER HEMLOCK.

Botanical Name.—Cicuta vagans.

Common Names.—Water hemlock; cicuta.

Habitat.—Wet or marshy places from British Columbia and Idaho south to northeastern California and the southern Sierra Nevada.

Description.—From three to six feet high; stem, erect or straggling; leaves, compound, growing direct from the ground; flowers, white and

appearing in July and August; root, fleshy and made up in two distinct parts.

Poisonous Parts of the Plants.—An oily liquid, most abundantly found in the root, but occurring in other parts of the plant.

Symptoms and Treatment are similar to those of water hemlock. The commonest cases of poisoning are among cattle. A piece of the root of the size of a marble is regarded as a fatal dose for a man.

FIG. 126. POISON HEMLOCK (CONIUM MACULATUM). ONE-THIRD NATURAL SIZE.

FIG. 127. GREAT LAUREL (RHODODENDRON MAXIMUM). ONE-THIRD NATURAL SIZE.

POISON HEMLOCK.

Botanical Name.—Conium maculatum.

Common Names.—Hemlock; wild hemlock; spotted parsley; stinkweed; herb bennet; poison root; poison snakeweed; cashes; wodewhistle.

Habitat.—Common on waysides and waste places in New York.

West Virginia, Pennsylvania, New Jersey, Ohio, the New England States, Michigan, Wisconsin, Illinois, Louisiana, and California.

Description.—From two to seven feet high; leaves, like those of parsley; flowers, small, white, in showy clusters, appearing in July and August; fresh leaves have a nauseating taste and, when freshly bruised, have a disagreeable mouse-like odor.

Poisonous Parts of the Plants.—A volatile alkaloid, known as conine,

FIG. 128. NARROW-LEAF LAUREL (KALMIA ANGUSTIFOLIA). ONE-THIRD NATURAL SIZE.

FIG. 129. STAGGERBUSH (PIERIS MARIANA). ONE-THIRD NATURAL SIZE.

found in the seeds and leaves. The root is harmless in March, April, and May, but is dangerous afterwards.

Symptoms.—Loss of muscular power; loss of sight; mind remains clear until death ensues from lung paralysis. There are no convulsions, as in water hemlock poisoning.

Treatment.—Emetics; tannin (strong tea or oak bark infusion); stimulants; hot water bottles at feet; artificial respiration; hypodermics of atropine.

BROAD-LEAF LAUREL.

Botanical Name.—Kalmia latifolia.

Common Names.—Laurel; ivy; mountain laurel; sheep laurel; poison

MOUNTAIN LAUREL OR CALICO-BUSH (Kalmia latifolia).

laurel; wood laurel; small laurel; rose laurel; high laurel; round-leaf laurel; American laurel; poison ivy; ivy bush; mountain ivy; ivy wood; big ivy; big-leaved ivy; calico bush; spoon wood; spoon hunt; kalmia; and wicky.

Habitat.—On rocky hillsides; in cattle ranges; on mountain slopes, from Connecticut to Eastern Ohio; along the Alleghanies to Georgia and Alabama as far as Louisiana and Alabama.

Description.—From four to eight and, sometimes, from thirty to forty feet high; leaves, thick, flat, and shining; flowers, pink, inodorous, in showy clusters, appearing in May and June.

Poisonous Parts of the Plant.—Andromedotoxin occurs in all parts of the plant except the wood. It is more poisonous than strychnine; sheep and cattle eat the plant and hundreds die from poisoning every year.

Symptoms.—Nausea; rather unsuccessful attempts to vomit; frothing at the mouth; grating of the teeth; irregular breathing; dizziness; drowsiness; coma and death.

Treatment.—Animals are treated with doses of oil, melted lard, or fat of bacon. This is successful if given early in the case. In cases of human poisoning, a one per cent alkaline solution of permanganate of potash is a chemical antidote. Other poisonous species of this family are the narrow-leaf laurel (*Kalmia angustifolia*); the great laurel (*Rhododendron maximum*); the staggerbush (*Picris mariana*); and the branch ivy (*Leucothoe catesbaei*).

FIG. 130. BRANCH IVY (LEUCOTHOE CATESBÆI).

FALSE JESSAMINE.

Botanical Name.—Gelsemium sempervirens.

Common Names.—Yellow jessamine; yellow jessamine of the South; wild jessamine; Carolina jasmine; woodbine; Carolina wild woodbine; evening trumpet flower.

Habitat.—Climbing over shrubbery and trees in woods and on low grounds from Eastern Virginia and Southern Tennessee to the gulf and into Mexico.

Description.—A woody vine, thirty or more feet in length; leaves, small and evergreen; flowers, large, fragrant, yellow, one to one and one-half inches long, appearing in March and April.

Poisonous Part of the Plant.—A poisonous alkaloid, gelsemine, is

FIG. 131. FALSE JESSAMINE (GELSEMIUM SEMPERVIRENS). ONE-THIRD NATURAL SIZE.

FIG. 132. JIMSON WEED (DATURA STRAMONIUM). ONE-THIRD NATURAL SIZE.

found in the bark of the root. The root is used in medicine, and many cases of poisoning result from overdoses.

Symptoms.—Nausea; ineffective attempts to vomit; pain in the eyeballs and the brows; loss of sight; weakness; staggering; suffocation; and death from lung paralysis.

Treatment.—A strong current of electricity; conine and atropine; the stomach pump; strong coffee; whisky; and artificial respiration.

JIMSON WEED.

Botanical Name.—Datura stramonium.

Common Names.—Jamestown weed; common stramonium; thorn

apple; apple of Peru; devil's apple; mad apple; stinkwort; stinkweed; Jamestown lily; the white man's plant.

Habitat.—Waste ground about dwellings everywhere east of Iowa and Louisiana; also in Kansas, Nebraska, and Colorado.

Description.—From two to five feet high; leaves, large; stem, coarse and green; flowers, white, two to four inches long, and heavily scented, appearing from May to September; seeds, numerous and as large as a grain of buckwheat.

JIMSON WEED.

Botanical Name.—Datura tatula.

Common Names.—Jamestown weed; purple thorn apple; common stramonium; thorn apple; mad apple; stinkroot; stinkweed.

Habitat.—More abundant towards the South and West than the last named.

Description.—Taller than the last named, and bears purplish flowers.

Poisonous Parts of the Plant.—The poisonous alkaloids, atropine and hyoscyamine, are found in the Jimson weeds. The seeds are especially poisonous. Adults are poisoned by excessive use of the alkaloids as a medicine or stimulant. Children eat the seeds with serious and often fatal effects.

Symptoms.—Headache; vertigo; nausea; extreme thirst; skin, dry and burning; dilated pupils; loss of sight; mania; convulsions, and death.

Treatment.—Emetics or stomach pump; strong tea; tannin; oak bark infusion; and stimulants. Pilocarpine and licorice are both useful in cases of dry mouth and throat.

BLACK NIGHTSHADE.

Botanical Name.—Solanum nigrum.

Common Names.—Common nightshade; nightshade; deadly nightshade; garden nightshade.

Habitat.—Rich, shaded grounds and fields in all parts of the United States east of South Dakota and Arkansas, and in wet and damp places west to the Pacific Ocean.

Description.—One to two feet high; stem, rough and angular; leaves, egg-shaped, and two to four inches long; flowers, small, white, and in clusters; berries, black, juicy, ripening from July to September or October.

Poisonous Parts of the Plants.—An alkaloid-like compound, solanine, in all parts, even the berry.

Symptoms.—Stupefaction; staggering; loss of consciousness, feeling, and the power of speech; cramp; convulsions; pupil, dilated; death in a small per cent of cases follows from lung paralysis.

Treatment.—Emetics; cathartics; stimulants, such as whisky, wine, or strong coffee. A solution of ordinary washing soda is recommended.

FIG. 133. BLACK NIGHTSHADE (SOLANUM NIGRUM). ONE-THIRD NATURAL SIZE.

FIG. 134. BITTERSWEET (SOLANUM DULCAMARA). ONE-THIRD NATURAL SIZE.

BITTERSWEET.

Botanical Name.—Solanum dulcamara.

Common Names.—Woody nightshade; bittersweet nightshade; wolf grape; violet bloom; scarlet berry; nightshade vine; garden nightshade; staff vine; fever twig; tetonwort.

Habitat.—Brooks and ditches from Massachusetts to Ohio, and in damp ground from Maine to North Carolina, and westward to Wisconsin and Missouri.

Description.—From three to six or eight feet high; climbing; leaves, thin, the lowermost of which are heart-shaped and the upper more spear-shaped; flowers, purple; fruit, red, ripening from July to October or November.

Poisonous Parts of the Plants.—In addition to solanine, there is also dulcamarine, which gives the plant a bittersweet taste, whence its name. The plant is mildly poisonous, and the symptoms and treatment are the same as in the foregoing plant.

SPREADING NIGHTSHADE.

Botanical Name.—Solanum triflorum.

Common Name.—Wild potato.

Habitat.—A native of the Western plains, abundant among the "prairie dog villages," and a garden weed from Arizona and Texas to British Columbia.

Description.—A low plant, with angular stem; leaves, with from seven to nine lobes; flowers, small, white, in clusters in groups of three; berries, large and green, more than half an inch in diameter.

Poisonous Part of the Plant.—The berries are poisonous, and, while not attractive to the eye, are agreeable to the taste. The poisonous principle is solanine.

Treatment.—Similar to that for black nightshade.

SNEEZEWEED.

Botanical Name.—Helenium autumnale.

Common Names.— Sneezewort; autumn sneezewort; autumn sneezeweed; staggerweed; swamp sunflower; false sunflower; ox eye; yellow star.

Habitat.—In moist ground from Connecticut to Michigan and Illinois and southward to the gulf; less abundant from Louisiana to Oregon and Washington; also in Arizona.

Description.—From one to three feet high; leaves, rather thick, and lance-shaped; flowers, showy and yellow, appearing in autumn.

Poisonous Part of the Plant.—The poison is chiefly in the flowers. The powdered plant, when snuffed, causes sneezing.

Symptoms.—Rapid pulse; difficult breathing; staggering; and great sensitiveness to the touch.

Treatment.—No fatal cases of poisoning from sneezeweed among human adults are recorded. When cattle are affected, doses of melted lard are of value.

BLOODROOT.

Botanical Name.—*Sanguinaria canadensis.*

Common Name.—Bloodroot; red puccoon; red root.

Habitat.—Low grounds around rocks; in meadows.

Description.—Flowers, white, slightly tinged with pink and blue; leaves, round and slightly cut; root, a tuber about the size of one's finger; when cut, a reddish orange juice is discharged.

FIG. 135. SPREADING NIGHTSHADE (SOLANUM TRIFLORUM). ONE-THIRD NATURAL SIZE.

FIG. 136. SNEEZEWEED (HELENIUM AUTUMNALE). ONE-THIRD NATURAL SIZE.

Symptoms.—Greatly increased flow of saliva; violent vomiting; severe purging; fainting; dizziness; cold feet and hands; pupils, dilated; temperature, low; pulse, slow; very marked prostration; thirst, intense; convulsions; collapse; and death from heart and lung paralysis.

Treatment.—Stomach pump or emetic, such as mustard (a tablespoonful in a small cupful of water, repeated in fifteen minutes if not

BLOODROOT (Sanguinaria canadensis).

effective) or syrup of ipecac, a teaspoonful every ten or fifteen minutes, until vomiting is produced. Follow the emetic with plenty of lukewarm water. Stimulate with brandy or whisky (two teaspoonfuls in a tablespoonful of hot water every ten or fifteen minutes), or aromatic spirits of ammonia (a teaspoonful in a little water every ten or fifteen minutes), or by strong coffee.

INDIAN TOBACCO.

Botanical Name.—Lobelia inflata.

Common Names.—Emetic herb; wild tobacco; puke weed; asthma weed.

Habitat.—Dry, open places all over the United States.

Description.—From one to two feet high; flowers, small, blue, growing out of a capsule, and appearing from June to October.

Poisonous Parts of the Plant.—The leaves, seeds, and inflated capsules are poisonous. "A dram of the powdered leaves is considered a fatal dose."—*Brundage.*

Symptoms.—Vomiting, depression, and prostration; purging; cold perspiration; pale, clammy skin; pulse, feeble; dizziness; convulsions; coma; collapse; and death in from one-half to four days.

Treatment.—Place the patient on his back in bed and let him maintain this position after the worst symptoms have disappeared. Stomach pump or emetic, followed by two tablespoonfuls of castor oil. Stimulate with brandy or whisky in small, frequent doses, or with aromatic spirits of ammonia. Use hot water bottles, or hot bricks, applied to the feet and sides of the body.

BOOK VIII.

INJURIOUS HABITS AND THEIR EFFECTS

ALCOHOLISM

is a diseased condition produced by the continued introduction of alcohol into the body. Notice several things about this definition. First, it is a diseased condition, therefore drunkenness does not develop into alcoholism until some diseased condition has been set up, and this usually requires frequent potations.

Proprietary Medicines.—Notice, also, that nothing is said about liquors. That is because a great deal of alcohol is consumed quite outside of liquors, especially in the form of proprietary medicines; usually called "patent medicines," although most of them are not patented. The damage done by these liquors pretending to be medicines is frightful. Thousands of men and women who could not be induced to enter a saloon, drink these "patent medicines" regularly in private until they becomed confirmed alcoholics. They contain all the way from twenty per cent to forty-four per cent of alcohol, while bond whisky is fifty per cent alcohol, and beer less than five per cent. The rest of the "medicine" is water, colored by less than one per cent of some drugs to salve the conscience (?) of those who advertise and sell the stuff, at a dollar per bottle, as a sure cure for every curable and incurable disorder from "blues" to cancer and consumption.

The First Steps in this road to ruin are often taken quite innocently. It is often by the advice of a friend, or even of an unscrupulous physician, that the first bottles are taken; thus a craving for more is started, and this soon becomes a consuming fire which is never quenched. And, incredible as it seems, there have been innocent consumers of "patent medicines" in an advanced stage of alcoholism who did not know what was the matter with them, and who were properly astonished and horrified at learning that they were just plain, common drunkards. So the drug store catches those who escape the saloon.

The spread of this has become so alarming that at last the Commissioner of Internal Revenue has ruled that all so-called medicines which contain as much alcohol as liquors do, must be listed and taxed as liquors. One of the most notorious of these hypocritical drunkard-makers is

no longer allowed to be sold as a medicine in the state of North Carolina.

As a result of long agitation, patent medicine advertisements are now refused by an increasing number of the most respectable periodicals. Some of these have made still greater sacrifices by refusing all objectionable advertising matter, such as promotes liquors, wild-cat mining, oil, or rubber stocks, extravagant claims of any kind, or those offensive to good taste. What moral heroism that involves, only those can understand who have had actual experience in the struggle to make a magazine pay.

But it matters not in what way the alcoholic thirst is first awakened, the frightful results are the same, and they are too familiar to need describing. The amount of money worse than wasted on intoxicants is appalling. The total which the people of the United States paid for alcoholic drinks in 1903 was one and one-fourth billions of dollars. To this should be added $100,000,000.00 as a conservative estimate of the retail cost of the flood of proprietary "medicines" which they swallowed, since these are practically alcoholic drinks and strong at that.

Who Pays the Drink Bill?—Strange to say, most of this burden of expense and disease falls upon those who are least able to afford it—the poor. The rich man's champagne cuts a very small figure in the nation's drink bill; that frightful total of waste was piled up by the millions of nickels which crossed the bar instead of buying food, fuel, and clothing for the poor workingman's wife and children. Visit any building in process of construction and note the scores of empty bottles strewn everywhere. They tell the story. How shall men be saved from themselves!

Of course, there is no excuse for all this folly. The exercise of a little self-control and self-denial would put an end to most of it. A great deal has been printed lately about alcohol as a food, and some profess to find justification in the experiments of Professor W. O. Atwater for their habitual use of it. It is not worth while to discuss the extremely doubtful value of alcohol as a food. We all know what it is as a drink, at least from observation, and that should be enough for any person of sense to leave it alone.

To the Third and Fourth Generation.—If the evils of alcoholism were restricted to the drunkard, he might claim that it was nobody's business what he drank. But the sins of the fathers shall be visited upon the children, even unto the third and fourth generation. Physicians know how true that is. There are certain diseases which are interchangeable—alcoholism, insanity and idiocy, epilepsy, syphilis, and tuber-

culosis—which means that the presence of any one of them in the parent is almost sure to manifest itself in the child by one or the other of these frightful disorders. And it is a striking scientific confirmation of the Biblical statement, that modern medicine has discovered that it takes at least three generations for one of these diseases to run itself out, even under the most favorable conditions.

Marry a Drinking Man?—Therefore the woman who marries a drinking man runs a frightful risk. If the risk were all her own, we might excuse, although we could not applaud; but the worst risk is her children's. And if the husband goes from bad to worse until he develops alcoholism, the wife is guilty of the most atrocious crime which is possible if she continues to bear children whose very lifesprings are poisoned.

The Nursery of Crime.—Alcoholism is bad enough in and of itself, but it does not stop there; it is the instigator and abettor of every crime on the docket. Murder, robbery, arson, licentiousness, and political crimes of every description find fitting inspiration, a congenial hatching place, and a safe retreat in the saloon. It is unnecessary to dilate on this plague spot which spreads everywhere like a social leprosy; every one is familiar with the details already.

Many Heroic Efforts have been made to combat this monstrous menace of everything which is good in the world, and the battle is still on. Although success is still far from sure, the nature of the struggle has changed decidedly within a century. It is no longer the correct thing for "gentlemen" to drink themselves under the table, nor for "ladies" to ply their callers with intoxicants. In good society, there has been developed a decided improvement in the outward observance, at least, of decency, the tendency being now more in the direction of coquetting with dangerous drugs. Also there has been developed a large preference for beer and other liquids containing a small percentage of alcohol.

The Good Old Times.—When we compare this with the "good old times" when every man drank rum as a matter of course, even the immortal Washington and New England clergymen; when gentry could get crazy drunk and sally forth into the streets to smash windows, insult women, and fight with the "watch," and yet not forfeit high consideration in society, it is apparent, even to a pessimist, that "the world do move."

The Dangers from Alcoholism To-day are different from those of one and two centuries ago. In general they are less open, coarse, and violent, and they need different treatment. Particularly is this true since the saloon "entered politics." There it is at the same time the most subtle and dangerous foe of good government, as well as of manhood

and womanhood. Its tremendous power is due to the fact that it has shrewdly planted itself deep in the soil of human nature by catering to a universal social need.

"The children of this world are in their generation wiser than the children of light." While reformers have been preaching against the saloon and holding up to drinkers the ideal beauty of teetotalism, the saloon has gone on quietly securing the support and friendship of the workingman by supplying to him that which he could not find in his miserable home or anywhere else—a bright, warm place for meeting his fellows socially, for learning of employment, for meeting his "boss," for raising a small loan, for loafing when out of work, and even for concocting crime. The saloon keeper is usually a power in local politics, with large opportunities to reward and punish. Opposed to all this concrete advantage, pulpit and platform have nothing to offer the workingman more tempting than the pure joys of a clear conscience and the unsympathetic virtue of a reform government. Is it any wonder that the saloon seems invincible?

The Three-Headed Monster.—So it comes about that the social problem of alcoholism is identified largely with the saloon problem, and that has its roots deep in "practical politics." The combination is tremendous, and it cannot be denied that the progress of reform is slow and uncertain. Evidently preaching does not fill the bill, not even of total abstinence. It might be better to take a leaf from the enemy's book of tactics. Is there any better way of drawing the workingman away from the saloon than to furnish him with something which will more than take its place?

Remedies of various kinds are being tried with more or less success—social settlements, missions, parental clubs, people's places, and the like. All honor to the heroic men and women who are devoting their lives to those efforts to help their fellow men to help themselves. They do immense good, but so far they are few and feeble compared with the enormous evil which they are combating. The most encouraging sign of the times is that modern social reform, ever since the establishment of Toynbee Hall in London a quarter of a century ago, has come to be more and more practical and scientific. Clear-headed, earnest men and women, leaving theories behind them, have gone right into the slums to live, in order to study and attack the evil at short range. Preaching has been made secondary to work. The salvation of our cities is hanging on their success.

ALCOHOLISM AND ITS TREATMENT.

Poisoning with alcohol is that condition of mind and body produced by excessive use of alcohol. What constitutes an excessive use of the drug varies with the individual. While the Pharmacopœia of the United States lays down very carefully the doses of other poisons used in medicine, it is rather significant that no mention is made there of doses of alcohol, wines, or liquors. But it has been laid down on good medical authority that the system cannot digest more than two ounces of alcohol a day. This would be the amount contained in two glasses of liquor, four glasses of light wine, or five medium glasses of beer. If a greater amount than that is taken in any case, by even the most inured, the effects as a poison are noted. In some cases one-half of these quantities in twenty-four hours will prove slightly poisonous.

Causes.—The causes of the poisoning are, directly, the taking of the poison into the system. Behind this are the causes for a man taking alcohol in poisonous quantities. These are the influences of unfavorable moral, social, and personal conditions; and heredity. Heredity may in a broad sense be made to stand for them all. It is not for a moment meant that anyone inherits from an ancestor a love of strong drink, or a desire to drink to excess. What a man does inherit is a lack of self-control; an enfeebled power of resistance; no moral courage to face the inevitable hardships of daily life; or a cowardice that permits him to seek a few hours of forgetfulness of uncomfortable conditions rather than to solve them by facing them. And this same inheritance shows itself in many other ways; he is slipshod in his methods and habits; he is one of "life's failures" for the very same reasons that he is a drunkard; not because he is a drunkard. This condition of mental and moral degeneracy is very largely the reason why a man becomes addicted to liquor. The habit of taking the poison in so-called "moderate quantities" for some time regularly, or of taking large quantities immoderately at times, produces physical changes and diseased conditions which cause a man to remain a drunkard.

Effects of Alcohol.—In acute alcoholism there is a congestion of blood in the brain; the stomach blood vessels are filled with blood (bloodshot); the interior of the stomach is lined with a quantity of mucus like rope; and the kidneys are also congested with blood.

In chronic alcoholism, there is not an organ that is not in some way affected by the poison. There is chronic catarrhal inflammation of the stomach; the alcohol passes directly from the stomach to the liver and

after congestion and other disturbances there is the condition known as gin drinker's liver; the kidneys are chronically congested with blood and become inactive; the interference with the circulation of the blood supply brings on chronic gastric catarrh; the heart assumes the condition known as fatty degeneration of the heart; there is hardening of the brain tissues and inflammation. The lowered vital resistance renders the subject liable to attacks of pneumonia and tuberculosis.

Symptoms of Acute Alcoholism.—These vary in degree and kind, according to the stage and sort of poisoning. In acute alcoholism, there are mild intoxication, drunkenness, acute delirium, and acute coma (insensibility). There is at first a feeling of exhilaration followed by a desire to carry out silly and foolish suggestions, caused by the action of the poison on the brain. When the action on the muscles begins, there is a lack of muscular control; the patient staggers and, perhaps, falls; if the amount of alcohol has been sufficient, the deep sleep or coma follows. This condition, technically known as dead drunk, is very often mistaken for the symptoms of other diseases which it resembles. Very often serious results follow a careless or hasty diagnosis of persons in this and similar conditions and of those suffering from fracture of the skull, apoplexy, uræmia, congestion of the brain, or hemorrhage of the brain, all of which diseases have some points in common. But there is a very certain diagnosis of acute alcoholism by which it can be distinguished from all these affections. It consists in pressing with considerable force upon the two notches in the orbit of the eye, known as the supraorbital notches. These can be felt just below the middle of the eyebrow. If sufficient pressure is exerted upon them, the patient suffering from acute alcoholism will be restored to consciousness and his senses. No case should be finally diagnosed as alcoholism, even though the odor of alcohol be upon the breath, until this infallible test is applied. There are also stertorous (snoring) breathing; bloated and congested face; swollen and purplish lips; contracted or dilated pupils of the eyes; cold and clammy skin; slow and feeble pulse.

In chronic alcoholism, there are marked symptoms of dyspepsia, coated tongue, foul breath, distressing vomiting in the morning, muscular tremor, broken rest and sleep, puffing under the eyes and yellow and bloodshot eyes. The face is either very pale, bloated, and flabby, or is blotched, swollen, and rough. Headache, dizziness, and visions are almost always present. The mental faculties become impaired; the memory fails; the judgment is bad; the moral sense and the will power are weak. The bowels are usually constipated and urine scanty,

due to the changes in the stomach and kidneys. Great irritability of temper is a marked symptom of chronic cases.

Delirium Tremens.—Delirium tremens, or mania a potu, is a disease of the brain, usually caused by an abuse of spirituous liquors, but sometimes also by great mental anxiety and loss of sleep. Delirium sometimes makes its appearance in consequence of a single debauch; but more frequently it is the result of protracted or long-continued intemperance. It usually supervenes on a fit of intoxication; but it not unfrequently occurs, also, when the habitual drunkard omits his accustomed draught.

Symptoms.—The approach of an attack is almost invariably preceded by the patient being remarkably irritable, with fretfulness of mind and mobility of body. He becomes very nervous and uneasy; is startled by any sudden noise, the opening of a door or the entrance of a visitor; is restless; the hands and tongue are tremulous; he complains of inability to sleep, and, if he dozes for a moment, he is awakened by frightful dreams. Soon delirium manifests itself; if questioned, the patient often answers rightly enough; but if left to himself he begins to talk or mutter; he is surrounded by frightful or loathsome animals; is pursued by some one who has a design upon his life; has terrible and ghastly visions. Though most commonly of a frightful or terrifying character, the delirium is not always so; occasionally the appearances are droll and ludicrous, and the patient seems amused by them; at other times it turns on some matter of business, as settling of accounts or telling of money, and the patient is in a perpetual bustle, and his hands are constantly full of business. The predominant emotion with a delirious patient is fear, and in his efforts to escape from an imaginary enemy he may be guilty of a murderous assault, or, as is more frequently the case, may take his own life; and hence he requires to be very carefully watched. The delirium continues until the patient sinks into a sleep, from which he awakes comparatively rational, or dies from exhaustion. In such cases, death is often sudden. The patient rises for some trivial purpose, and falls in a faint, from which he never recovers; or at length, after passing many nights without sleep, he sinks into a state of coma, which terminates in death. This disease, however, is rarely fatal, unless where the strength of the patient has been seriously impaired by long-continued excesses.

Treatment.—The great remedy is sleep, and the best means of inducing this is by chloral, which is to be given in large doses, and frequently repeated, until the desired effect follows. Sometimes it is necessary, in

order to procure sleep, if the patient is in a very exhausted state, or if the disease has been brought on by the cessation of an accustomed stimulus, to allow the patient a certain quantity of his ordinary beverage; but this should not be continued longer than he can do without it. Chloroform has also been recommended as a means of procuring sleep when opium fails; or better probably than either will be found to be the hydrate of chloral in doses of from five to fifteen grains. Some medical men recommend large doses of digitalis, but the nature of this remedy renders it unadvisable in the hands of any but a medical man.

If these efforts are successful and the nervous excitement is subdued, there will be great prostration of strength. The great object will then be to restore the tone of the stomach, and to enable the patient to overcome that craving for alcoholic stimulants which is sure to send him back into the paths of intemperance if it is indulged. Strychnia in doses of one-sixtieth of a grain three times a day combined with elixir of calisaya makes an excellent tonic for these cases. A cold shower bath affords great relief.

This disease is to be carefully distinguished from inflammation of the brain, with which it has many symptoms in common; for bleeding, which is resorted to in the latter disease, would be of the utmost danger in this.

Prognosis.—This is good in acute alcoholism provided the patient is manageable.

But in chronic cases there is such complication of disease in serious forms, as well as from delirium tremens, that the danger is great. Heart failure and coma are always to be feared. Many cases of alcoholism are fatal by reason of succumbing to lobar pneumonia.

Treatment.—Very many of the serious consequences of over-indulgence of liquor might be averted or entirely prevented if regular meals of nourishing, easily digested food be taken during the period and if the bowels are kept open. Much of the harm results from going a long time without food in the stomach. For there is no nourishment in liquor. Hence the caution against taking liquor on an empty stomach. What the stomach most needs at these times is good care; and when the early morning drink is taken, it should be followed immediately by food of some sort, if only in the form of a glass of milk with a raw egg. Very often in the attempt to work up an appetite by the use of liquor in the morning, the object is defeated by taking too much and all desire for food is lost.

If, during the drinking period before a stage of acute alcoholism is

reached, the stomach is cleansed of the ropy mucus which accumulates in it and the liver is relieved of the alcohol which forces its way directly to it through the portals, the severity of the attack will be lessened and much time in the after-treatment will be gained. Such a dose as the following may be taken or given with advantage during the course of drinking:—

Calomel,.....1-3 grain.

Take one such powder every hour for five hours and follow with Epsom salts, Hunyadi Janos water, or other saline aperient. At such times the administration of medicine is often difficult or well-nigh impossible; but a Seidlitz powder in the morning is often willingly taken, which affords some measure of help in this direction. Strong, black coffee in the morning is an excellent stimulant which can often be made to take the place of a morning stimulant. But it must be strong and hot and not in too large quantities at a time. Such a cup of coffee will produce about the same effect as from one to two grains of caffein. Aromatic spirits of ammonia in half-teaspoonful doses in water every two or three hours will serve as a stimulant in place of liquor.

In acute alcoholism, where there is stupor or coma, the first step in treatment is the same as in other cases of poisoning, viz.: to administer an emetic to remove the alcohol from the stomach to prevent further effects from it. To eliminate the poison from the system, there is, perhaps, nothing so efficacious as:—

Solution of Ammonium Acetate,.....2 ounces.

Take a tablespoonful in water every two hours.

For nervousness, when very great, use:—

Extract of Guarana,.....5 grains.
Bromide of Sodium,.....30 grains.

Take one such dose every four hours in water.

Rest and sleep are the great things to be sought for to prevent hallucinations, ordinary delirium, or delirium tremens. Where these threaten, the physician will administer a hypodermic injection of morphia, or atropin, or hyoscin.

Restlessness, insomnia, hallucinations, and mild delirium are also controlled by chloral hydrate in thirty-grain doses, or by trional in thirty-grain doses, but these are better not given and certainly not repeated without medical direction.

Sleep and rest will follow the elimination of the poison and the supply of nourishing food.

Patients have usually been without food for some days and the stomach is in bad condition. Where food can be tolerated, give milk and limewater, or milk and Seltzer. Hot broths, hot beef tea, well seasoned with cayenne pepper, should be given in small quantities every two hours.

To increase the appetite and to tone the stomach use:—

Tincture of Nux Vomica,.....4 drams.
Tincture of Capsicum,.....4 drams.
Compound Tincture of Gentian,...to make 4 ounces.

Give a teaspoonful well diluted every two hours.

If aromatic spirits of ammonia are given to stimulate the heart and nerves, the above may be given every four hours and the ammonia alternate with it. The ammonia may then be given in teaspoonful doses in hot milk.

For alcoholic nausea and vomiting use:—

Nitrate of Strychnia,.....¼ grain.
Fowler's Solution of Arsenic,.....20 drops.
Glycerine,.....3 drams.

Take one teaspoonful every four hours.

The withdrawal of alcoholic stimulants from patients suffering from poisoning by it, whether acute or chronic, is a matter of skill, judgment, and tact. There is no doubt that the disease will continue so long as the use is continued. But there is often a danger of withdrawing it too suddenly in some cases. No cure of the disease can be permanent if it is continued. This is a mental and moral question with the patient. Where he is willing to help, much can be done in the way of a cure. Without this support and willingness on his part, there is little hope. Much suffering must be undergone by him during this time. There is need of discipline which home life and private treatment do not afford. Hospital or sanitarium treatment is of the greatest use; but, best of all, if a man can be taken away from associations and to places where liquor cannot be obtained, with the addition of outdoor life and good, healthy surroundings, combined with a companion who does not drink and who can exert some control and good influence over him, then there is good reason to expect a cure.

But no matter what the sort of treatment, the patient will always do better if a large and wholesome sympathy is extended to him. On the development of symptoms of addiction to liquor or forming of the habit, a man's friends should get together and lend him all the support possible,

not in an ostentatious, offensive, patronizing way, but steady, well-directed assistance and interest, with special efforts to supply him with those elements of self-control and self-respect of which he feels the need. There is no condition of mind or body that so much demands the fellowship and assistance of his friends; and none that will respond so rapidly to tactful efforts.

CIGARETTES.

If a boy or girl is quite determined to accomplish self-destruction by a slow but sure route, there are several ways open. There is the alcohol route, or the cocaine, morphine, acetanilid, or arsenic route, or cigarette smoking. Any of these may be guaranteed to afford the young aspirant for perdition a maximum of physical suffering and disgrace in this life, to say nothing of eternal punishment through enfeebling the will, blunting the moral sense, and the general lowering of the whole spiritual tone.

"Coffin nails" is the name felicitously given to these little nuisances and neurotics. It is difficult to understand the hold which they have upon the popular fancy. One would suppose that the annoyance of being obliged to fold them so frequently, light up, puff a few times, and then have it all to do over again, would discourage the cigarette fiend. Those most addicted to cigarettes are usually least addicted to persistence and industry in any other direction, yet they seem to find a fatal fascination in eternally rolling the little paper tubes. Perhaps it is that very fact, the simple monotonous repetition of the mechanical act, furnishing just enough occupation for their idle fingers and feeble minds.

Most Smoking is altogether an acquired taste, finding its origin, not in any natural craving, but in the boyish aspiration "to be a man." Boy-like he overlooks the fact that many noble, strong men never smoke, and infers from the too prevalent example of his elders that he must learn to smoke if he is to be manly. Probably if it were not for this unfortunate example, there would be no cigarette smoking, for of itself it cannot be said to convey any positive pleasure.

The Secret of its Power and of its mischief is in the hold which it soon secures upon the nervous system. Like every other drug, nicotine —the active poisonous principle of tobacco—has two effects, a primary and a secondary. For most people its first effect is sedative, but continued use brings on great nervous irritability and general depression. Excessive use soon produces alarming symptoms: nausea, faintness, vertigo, feeble digestion, failure of the eyesight, distress about the heart

convulsions, insanity. In short, it is a powerful depressant, especially of cardiac action, so that "tobacco heart" has come to be recognized as the cause of many sudden deaths. Of course mind and memory are impaired and ambition destroyed.

The Newspapers Frequently Record the disastrous effects of cigarette smoking. Anyone who doubts it has only to engage the services of a clipping bureau and he will be supplied with a surfeit of murders, assaults, thefts, insanity, and deaths due to cigarettes. Just for illustration: In 1905 a Cleveland boy of twenty-one years of age was put on trial for assaulting his mother. He was in the habit of smoking fifty cigarettes daily. A Louisville boy of fourteen went insane on a daily dose of one hundred coffin nails. Another, twenty-three years old, in London township, Michigan, accomplished a like result on one hundred twenty-five daily. A baseball pitcher died at Chillicothe, Ohio, from only twenty-five cigarettes a day, although he was twenty-nine years old. But the small number is explained by the fact that it had been his daily average for fifteen years.

Generally speaking, the younger the smoker the worse the effects. Thus it required only thirty-five cigarettes a day to put a Chatsworth, Illinois, youth in the insane asylum. Whatever opinion may be held as to the effects of tobacco on adults, all agree that it is deadly poison during the formative period of the "teens." But even adults are not safe. There was a case reported in the newspapers, of a Chicago traveling salesman who had been addicted to cigarettes so long that his symptoms became alarming and he promised his wife to drop them. He did so, but his nervous system had become so dependent on the sedative that the sudden deprivation drove him temporarily insane. He went back to his slavery, feeling that he was a doomed man either way.

No Cigarette Fiends Need Apply.—This vice has become so widespread and its effects so generally understood, that a very determined war is being waged upon it from all sides. The efforts of the anti-cigarette leagues are being ably seconded by employers of labor, including railroads, banks, manufactories, wholesale and retail firms. Many of them absolutely refuse to hire or retain cigarette smokers in their employ; one glance at the telltale finger stains is sufficient to secure a refusal or a dismissal. Railroads in particular say that they cannot afford to take any chances with boys and men having unreliable nerves or eyesight. Even the grand jury for November, 1905, in its report on the penal institutions of Cook County, Illinois, recommended that cigarettes be abolished from the county jail.

Birds of a Feather.—Like alcoholism, the cigarette vice must bear the odium of much related evil. The general lowering of the moral tone, the loss of true manliness and self-respect, lead inevitably to loafing, profanity, obscenity, lying, stealing, and kindred crimes; while the extreme nervous irritability prepares the way for deeds of violence. This *a priori* proof is confirmed *a posteriori* by examining the fingers of convicted criminals when they are first brought to our penal institutions—nearly every examination will reveal the familiar yellow-brown stains. Superintendent George Torrance, Illinois State Reformatory, testifies that out of 278 boys in that institution, between the ages of ten and fifteen, 92 per cent had the cigarette habit when admitted. Of these, 85 per cent were "cigarette fiends." That tells the story.

Popular Fallacies.—There are several mistaken notions current in regard to this vice and its effects. For example, it is supposed that the danger of cigarettes lies in their being "doped," that is, treated with opium, cocaine, etc. That is out of the question for the simple reason that they are sold too cheaply to admit of introducing expensive drugs. Furthermore, a large number of smokers roll their own cigarettes. Another fallacy is that strong tobacco is the cause of the deadly results. Quite the contrary, the tobacco is usually mild.

The Real Reason.—What, then, is the real reason? There are several. First of all, the early age at which the vice is usually started. In the teens, the nervous system is far more susceptible to toxic effects than later. Secondly, the vast number consumed daily by the "fiends." One hundred cigarettes a day are as injurious as ten full-sized cigars or twenty pipes of tobacco. Third, the habit of inhaling. This, by giving the full effect of the tobacco, affords the greatest satisfaction and inflicts the greatest damage. Inhalation of cigarette smoke is easier than that of cigars or pipes because the smoke is milder and less in quantity, but the habit thus formed is afterwards extended to all smoking with still more disastrous effects.

Tobacco Smoke is Composed of several ingredients, of which the most poisonous are nicotine and carbon monoxide. The latter, mixed with hydrogen, forms the deadly "water gas." Nicotine is one of the swiftest and surest toxics known, and has been used by murderers for poisoning their victims. If either of these two were present in tobacco smoke in appreciable quantities, the smoker's shrift would be short indeed. But when the deadliest poisons are introduced in minute but frequent attenuations, the body has an adaptability which enables it to tolerate their presence, manifesting only the chronic symptoms.

Guard the Children.—These facts need only to be presented without exaggeration to young people of sense to enlist them on the side of health, and morals, and decency. Those without sense must go their own way to their own place. "Against folly the gods themselves contend in vain." Teachers and boards of education find no difficulty in enrolling thousands of enthusiastic young anti-cigarette leaguers as soon as the matter is put before them in its proper light. The children are more sinned against than sinning. This cigarette plague has sprung up within a quarter century, sedulously spread by unscrupulous manufacturers and dealers by means of pictures, gaudily colored boxes, prize labels, and other devices for luring the thoughtless. At the same time the price has been reduced to bring them within the reach of the poorest. Even girls have been drawn into the net in alarming numbers. But there these devil's own overshot their mark. Public opinion in the United States, careless and optimistic though it be, has not yet been educated down to the level of Europe and Asia, where the spectacle of women smoking in public excites no comment. Far distant be the day when public opinion shall be ready to tolerate the idea of American women defiling their pretty lips with either cigarettes, cigars, or pipes. The report that girls were learning to smoke cigarettes capped the climax and sealed the fate of the cigarette. To their credit be it said that many of the better class of girls have formed leagues of their own, ostracizing every boy known to smoke cigarettes. That is the way woman may exert her influence most powerfully for good.

The strong tendency of tobacco to produce cancer when brought habitually in contact with an irritated tissue is well known; especially through the pitiful deaths of President U. S. Grant and of Emperor Frederick III. of Germany. As these words are being penned, the newspapers contain accounts of operations on two actors, one in New York and the other in Chicago, to remove cancerous growths caused by excessive smoking. Each man was obliged to have his tongue cut out to save his life, and for one of them it was the fourth operation, successive portions of his tongue having been cut away.

DRUG FRAUDS.

There are two kinds, those in which there is too much drug and those in which there is too little. The second class has been described already under Alcoholism. It covers all the proprietary "medicines," which usually contain less than one per cent of drugs and from twenty to forty-

four per cent of alcohol, so that they are really powerful intoxicants and must be classed as such.

The class which contains too much drug may be further subdivided into two species, those which conceal the drug ingredient and those which advertise it. In either case both the intent and the effect are evil. The first is a drug fraud; the second is not only a fraud, but an open catering to one of the most deadly vices.

Under the First Head is marshaled a long array of headache powders, soothing syrups, asthma, catarrh, cough, consumption, and kidney "cures"; excluding those which print a formula of the ingredients. They are all frauds in that they promise a cure, whereas they only relieve from pain. A relief is justifiable, provided it is not a dangerous relief, and provided the remedy is not worse than the disease. The public is not squeamish when it is in pain. What it wants is to be rid of the pain, and that quickly. Of this intolerance of suffering, the ready relief and quick pain killer take full advantage and reap riches, while the public exchanges its pain for chronic disease and often for speedy death. The sales are enormous and increasing in geometric ratio, fostered by every pleasing and lying device of skillful advertising.

The Worst of These Devices is the free sample distribution. The unscrupulous dealers are not satisfied with what might be considered the legitimate business of relieving suffering, they reach out with greedy claws for the far greater profits which can be secured by starting a vicious craving and then pandering to it. They call it "supplying the public demand." They know very well that thousands of unthinking people, who are always glad to get something for nothing, will be sure to put a free sample drug into their mouths whether they need it or not. The craving is easily started and then they must have more. The fiend who sells the stuff rubs his hands gleefully as the customer who first came in once a month begins to come in once a week and then semi-weekly, until he is fully started on the downward career of the "dope fiend." He, or she, has now but one object in life, to secure greater and greater quantities of the deadly drug which drags down to hell; for the sake of that indulgence, money, health, honor, friends, are recklessly sacrificed until death or the madhouse closes the tragedy of a Lost Soul.

The Dangerous Ingredient of most, if not all, headache powders is acetanilid, a derivative of aniline, which is obtained from coal tar. It is a powerful depressant, especially of the heart; collapse has been known to follow a dose of four grains, and death, a dose of five grains. It is four times as powerful as antipyrine. The newspapers have published

twenty-two deaths from acetanilid poisoning in two years. How many more cases of death from heart failure were due to the same drug, it is impossible to say, but it is a significant and alarming fact that deaths from that cause are decidedly on the increase in the United States. These acetanilid powders are guaranteed on the wrappers to cure an absurd multitude of diseases, which fact alone should condemn them for intelligent people. Nor do they utter any warning of the dangerous character of their chief ingredient; on the contrary, one of the most popular of the headache powders, after claiming to cure nearly every known disease, caps the climax of mendacity by claiming to be a powerful tonic for physical and mental fatigue. Now, the real action of acetanilid is directly the opposite, being so powerful a depressant of the heart that sufferers from cardiac weakness take it at the risk of their lives. In July, 1905, a girl in Philadelphia, eighteen years old, took the dose of two powders, according to the printed directions. In three hours she was a corpse.

Perhaps the Most Atrocious of these frauds—if it is possible to estimate degrees in such villainy—is the soothing syrup, since here the crime is committed against helpless babes, who have the greatest claim upon every one's pity and protection. The number of fortunes which have been acquired through this modern slaughter of the innocents is beyond computation; every person of intelligence knows that their effect is due to morphine, codeine, or some similar drug; and still the infamy flourishes. If Herod is able to keep himself familiar with mundane affairs, he must grieve to think that he was born too soon to get into the soothing syrup business.

Cocaine Frauds.—The drug frauds which carry the formula on the bottle are usually the asthma, catarrh, cough, and consumption "cures," containing cocaine. They are frauds because they promise a cure which they cannot effect; they are worse, because the publication of the formula is a cunning invitation to the "cocaine fiend" to buy the stuff. One popular cough "cure" contains four per cent of cocaine. Of the frightful effects of the cocaine habit it is hardly necessary to speak in detail. The person addicted to it has a pale, cold skin, often bluish; feeble pulse and labored breathing; anesthesia and illusions of the senses; thirst, dryness of throat, and malnutrition; headache, giddiness, and restlessness; trembling of the limbs and muscular twitchings; death usually from heart failure. Of course the mind is impaired and memory almost useless. The only thing for which the wretch cares to live is to get more cocaine.

MORPHINE AND THE DRUG HABIT, AND ITS TREATMENT.

Symptoms.—There is slowly developed a marked irritability of temper, so that the patient either flies into a rage or breaks into tears. Melancholy and delusions become so profound as to suggest insanity. The ordinary acts of life are performed with stealth and slyness. Habits of exaggeration, distortion, and prevarication are very pronounced. All of the person's ingenuity and skill are employed in subterfuge and deceit in order to procure the drug. The most characteristic and marked symptom is the contraction of the pupils of the eyes, even to the pin point size in some cases. The patient seldom looks another in the eye without a fluttering of the eyelids, either from nervousness or from an effort to hide the small size of the pupils.

Perfect isolation and absolute control of the patient are absolutely necessary to work a cure. All treatment is useless and disappointing so long as there is any possibility of the patient procuring or of using the drug without the knowledge of the physician.

Treatment.—There are in use two methods of treatment. The first consists in the gradual decrease of the dose so that at the end of a week all has been withdrawn. Of course something must be substituted for it to meet the fearful mental and physical suffering which this causes. Great care is needed that the medicine which replaces it does not lead to the contraction of a habit in that direction. It is a comparatively easy matter to substitute alcohol for morphine. Many patients do that for themselves. That is only exchanging a Roland for an Oliver.

On the withdrawal of the drug, there will be great restlessness, irritability, depression, purging or diarrhœa, and extreme mental and physical suffering. Cramps in the legs, feet, arms, and hands are also noted. The great nervous depression is removed by doses of hyoscyamus; the circulation is kept up by strychnine and digitalis; the purging is controlled by:—

Aromatic Sulphuric Acid,.....15 drops.
Fluid Extract of Hæmatoxylon,.....1 dram.

Chloral, sulphonal, or trional may be used to control the mental excitement and to procure sleep and rest. The cramps in the extremities are relieved by hot bandages; and a short, quick, hot bath will lessen the nervousness. The patient is supported during the first stage by hot stimulating food highly seasoned with cayenne pepper.

The second method of treament consists in the immediate and complete withdrawal of the drug, with substitution of hyoscine administered

in small hypodermic doses. In this treatment, the patient is either stupefied or put to sleep during the greater part of the period of ordinary suffering and so is helped over it. Then the hyoscine is withdrawn and the patient helped to recovery.

From either of these methods there is great danger of lapses. That is true of all methods. Some doubt has been cast upon the permanency of any cure for the habit; but that is a great exaggeration of the number of lapses. There are some of such weak will power and so deficient in moral and physical courage that the inability to face the ordinary hardships and difficulties of daily life drives them back to the old bondage. But, on the other hand, there are many cases of permanent cure known to every physician. There is no possibility of self-treatment and reduction outside of a hospital or sanitarium, where the necessary rigid control and discipline can be given.

INSANITY.

What is it? Easy to ask, but hard to answer. For, in the first place, the question involves the deeper problem of the nature of the soul and its relation to the brain. The materialist, who regards spirit as merely highly refined and sensitive matter, has no such difficulty, for he needs only to define insanity as a disease of the brain tissues.

But from the earliest times there has been a strong belief in the existence of a something called a Soul, quite distinct from matter, at the same time that it uses the brain and voluntary nervous system as its instruments. But the connection between the two is so intimate that any injury, disorder, or disease of the instrument immediately affects the user; and, if the injury is sufficiently severe, the two part company at once and forever.

Another Difficulty in defining insanity arises from the almost infinite variety of its manifestations, and the vagueness of the dividing line between sanity and insanity. It has even been said that we are all more or less insane. Certain it is that many people considered sane are all the time doing crazy things, and sometimes it is almost impossible to say just when and where their absurd performances cross the boundary line. In fact, the moment suspicion or investigation is seriously directed against any person's mental condition, he or she will find that many words and acts which before had been charitably labeled "eccentricities" will suddenly take on significance as evidence of insanity.

The Modern Scientific View of insanity is that it is strictly and wholly a disease of the brain, and it is to be treated accordingly. But

there is still a strong belief, especially among the laity, that it may also be a disease of the mind or soul, either wholly or in part. This belief has been strengthened by the commission of atrocious crimes by those who appeared to be mentally or morally unsound without manifesting any cerebral symptoms of disease. All this ground has been fought over repeatedly in courts, especially in the case of Guiteau, the murderer of President Garfield.

The necessity for defeating the plea of insanity in defense of such miscreants has greatly strengthened the view that insanity is strictly a physical disorder. Nevertheless, the fact remains that constant brooding over wrongs or troubles, real or imaginary, will cause one to become possessed by fixed delusions. That is a matter of common observation, and also, every one who is skillful in introspection is conscious of such tendencies which must be resisted. Usually such delusions are comparatively harmless, and the person is regarded merely as a "crank," but under exceptional conditions some delusions may become so extreme as to result in action which clearly passes the boundary line of sanity.

Emotional Insanity is the name usually given to this, although many deny that there is any such thing. The difficulty of holding people accountable for the acts of emotional insanity is met by showing their responsibility for their mental and moral condition. Every one knows from his own experience that he can always choose between allowing himself to brood over troubles and turning his mind resolutely to other matters. If he is wise, he will not allow his mind to get into the habit of running constantly on one narrow subject, especially if it is painful or exasperating; even neutral subjects should be varied, and should be pursued with a mind always open to all the evidence and not previously committed to any theory or doctrine. It is by neglecting to exercise this power of choice that fanatics of all kinds distort their mental processes until they persuade themselves that they are justified in committing the most atrocious crimes in cold blood. For all crimes committed by those who thus pervert their own judgment, full punishment should be inflicted, for they cannot set up their voluntary self-perversion as an excuse in the absence of any brain disease. They have even less excuse than the man who commits murder under alcoholic excitement, and he is held responsible for his acts.

The Duty of Every One, whether he takes the strictly materialistic view of insanity or not, is to avoid carefully everything which will affect the soundness of his mental and moral processes. The nervous system including the brain, is a highly sensitive and extremely complicated

telegraph system, in which each nerve and ganglion is so closely related to every other that "an injury to one is the concern of all." Therefore no one should overtax or in any way abuse any part of his nervous system.

At the same time, by cultivating a cheerful disposition, improving the mind, and avoiding brooding, we should secure a sane outlook upon both the great world and our own little corner of it. Particularly should those who are compelled to make a living by long, monotonous toil relax and refresh their minds by suitable reading, even if they can spare but a few moments daily. Those precious moments should not be wasted in reading yellow journal accounts of crimes and scandals, but in storing the mind with the best thoughts in literature, or with valuable facts which shall increase the worker's efficiency. Both kinds of reading will give him something to occupy his mind profitably during toil, to the exclusion of brooding or evil thoughts. Always have a little book in your pocket, to be pulled out at every suitable opportunity. How many thousands of precious hours are lost daily by men and women traveling to and fro from their work, gazing vacantly through the car windows—"golden hours lost, each set with sixty diamond seconds; no reward offered, for they are lost forever."

Who is Insane?—Outside the legal question of punishment above noted, it makes little practical difference which theory of insanity is held—the only question is, Has the person lost intelligent control of himself?

The existence of brain disease, and even of delusion, hallucinations, and illusions, does not prove insanity in the sense that the person is irresponsible. For there have been many cases of people afflicted with various aberrations of the senses or of the mental faculties, of which they were perfectly well aware and which they did not allow to pervert their judgments or vitiate their actions. Such persons are not sane in the sense that "sane" means perfectly "sound," yet it would be most cruel and unjust to brand them with the stigma of insanity. In fact, if every one who is not perfectly sound mentally is to be adjudged insane, "who then shall be saved?" It is absurd on the face of it, and yet there are some who uphold that theory.

Kinds of Insanity.—Of course, violent mania is easily recognized; except when it is feigned for a purpose, as to escape the consequence of a crime. Even then the sham can always be exposed by a skillful physician; for no one can simulate mania for any length of time successfully in the face of searching tests. It is more difficult to diagnose absolutely

the kinds of insanity which are near the border line and therefore resemble conditions of mind which are still responsible. Hysteria, melancholia, kleptomania, and inordinate egotism often hover between responsibility and irresponsibility.

Still more difficult is it to diagnose a latent insanity, which comes to the surface only under special conditions. In such cases, the subjects appear perfectly rational, until some exciting cause produces an outbreak. Often they are very cunning in concealing their condition, and succeed in baffling all investigation until some one subject is touched upon; then the special insanity suddenly manifests itself.

The Test Question, therefore, must be, as already stated—has the person lost intelligent control of himself? Men and women eminent in the world's history, whose exceptional achievements prove them to have been as free from insanity as anyone, have been subject to illusions and hallucinations of the senses, sometimes consciously, sometimes unconsciously. They have seen "visions" and heard "voices"; in some cases obeying, in others disregarding them.

A common example of illusion is color blindness. The man who drives madly into an open draw is not necessarily insane; he may be only unable to tell red from green. In many cases of accident or disease of the brain, certain faculties have been impaired or destroyed—such as speech, hearing, or motor power—without impairing the patient's rationality. Of course, they are not "sound" mentally, but they are not insane.

The Causes of insanity are as numerous as the varieties of the disorder. Most unfortunately, the increase of civilization multiplies the causes, and an effective remedy is hard to find. For, in spite of any amount of good advice, both professional and popular, and the general diffusion of intelligence, people will persist in continuing to do the very things which they know are likely to produce insanity.

The causes may be either direct or contributory. Among direct causes are many diseases, especially those of a nervous type, as epilepsy, hysteria, meningitis, debauchery, alcoholism, excessive use of tobacco or drugs, long continued worry or mental strain, great grief, fright, and sometimes even joy. But contributory or predisposing causes generally precede the immediate and apparent cause. Everything which exaggerates nerves at the expense of the muscles, drains the vitality or weakens mind and will power, prepares the way for the final shock which snaps the golden cord.

The Rush for Wealth.—Of course, the mad rush for wealth, especially in our cities, and the equally desperate struggle of the poor to

escape being submerged, predispose more and more to the loss of reason. While those who are wise refuse to allow themselves to be caught in this crazy whirl and carefully select the good of modern civilization while eschewing the evil, the unthinking majority rush recklessly on, aggravating the artificial and unwholesome conditions of urban life by utter disregard of hygiene and sanitation. Instead of seeking the change and refreshment of a quiet, suburban home, they crowd into filthy, noisy, treeless streets; hastily gulp down indigestible meals; keep late and irregular hours; and then spur their jaded nerves with strong coffee, tobacco, and liquors. When the outraged nerves take their revenge through insomnia, headaches, and neuralgias, the next resort is to all manner of drugs, and then the "dope fiend" is ripe for a grand final crash. In some moment of special strain, the few wits he or she has left, go glimmering.

Rural Insanity.—But too little is almost as bad as too much. Out on the isolated farm or ranch, human life almost stagnates. The killing monotony of seed time, harvest, and winter, with little human companionship and almost no social pleasures, no outlook upon the world, no ideals, no ambitions, can be realized only by those who have suffered it. Especially is this true of the farmer's wife, who is too often a mere slave; broken down by work, sickness, and childbirth; with no joy of life and no hope of rest this side the grave.

It is a pleasure to know that, although urban conditions increase insanity, rural life is becoming more and more favorable to mental soundness. Several agencies are contributing to this happy result, all having the common effect of bringing the farmer into closer touch with the great outside world, stimulating his mental faculties and breaking up his lifelong monotony. Rural free delivery brings him letters and papers daily; the long distance telephone enables him to talk with anyone at any time, and to order goods, which the mail order house rushes out to him by the next train. The traveling library brings to his door the latest literature, while the suburban trolley is pushing farther and farther into regions which the railroad does not reach.

Meanwhile the threescore agricultural stations established and maintained by the United States Government are teaching the farmer how to farm, how to know soils and fertilizers and rotation of crops, how to put brains into his work. An army of agents and drummers besiege him to buy the best labor-saving machinery and the latest improvements of all kinds. The large central school, with 'bus conveyance for distant pupils, is supplanting the "little red schoolhouse" with its meager educational facilities.

The Solution of a Great Problem.—And in so many ways the rural population, which is a little more than half of the total population, is waking up. This fact will not only diminish the tendency to rural insanity, but—best of all—will furnish a solution to the most perplexing problem of our civilization—the rush of the young men and women from the farm to the city. Whatever makes life on the farm more endurable will relieve the congestion of the cities, and that will help to diminish urban insanity also.

This beneficial result is already beginning to manifest itself, for the last United States census shows that the cities are not increasing as rapidly as they were.

The Treatment of the Insane has been one of the dark blots on the page of history. In the earliest times, these unfortunates have either been regarded as inspired and listened to with superstitious reverence, or they have been judged to be possessed by devils and have been driven into the wilderness to perish. After civilization had progressed far enough to recognize some measure of moral responsibility for the unfortunate, a pretense for caring for the insane was exhibited, but with so much attendant neglect and brutality that being driven into the wilderness was scarcely a worse fate.

Matters improved very slowly, and it is only in recent years that any really humane and intelligent care has been accorded the irresponsible. Even now there is much left to be desired. In the best asylums and hospitals, the treatment aims to surround the inmates with cheerful and healthful environment and the least possible restraint.

The number of insane is increasing in most civilized countries. For the United States, the statistics of the twelfth census on this subject are not yet available; but in the decade from 1880 to 1890 there was an absolute increase (in round numbers) from 92,000 to 106,500 insane, Relatively to the increase of population in the same period, there was a slight decrease of insane. The number in 1896 is estimated at 145,000.

Safeguards of the Insane.—Of course in a matter of such delicacy and complexity as the detection and care of insanity, there is infinite opportunity for blundering and downright rascality. The best of laws cannot altogether prevent that; nothing can do it but an alert and intelligent public opinion, which insists on electing the best men to public office, and then holds them to a strict accounting for the judicious exercise of their authority. All asylums, both public and private, should be kept under strict supervision.

Almost equally difficult is it to safeguard the commitment of the insane

whether to public or private asylums. It is popularly believed that many really sane people have been railroaded into confinement by designing persons, and in the case of eccentric persons, especially, it would not be very difficult. So avoid being "cranky," particularly if you have enemies or wealth.

Safeguards of the Sane.—But if we should try to make it any more difficult to commit the insane, we should fall into the opposite evil of not protecting the sane. For it happens too often that friends and relatives feel such repugnance to the stigma of insanity, that they try to care for the unfortunate in private long after he should be in an asylum, or he is allowed to be at large simply because it is nobody's business. Not until his insanity has broken forth in some terrible crime is he at last placed where he belongs. Such cases are reported almost daily, sometimes the butchery of whole families by insane persons. A higher sense of responsibility to the public welfare would lead those who are nearest to such cases to take action before the crime was committed, instead of afterward.

Responsibility of Experts.—A great deal of public condemnation has been visited upon experts, physicians, judges, and juries because they either have or have not declared people insane. Doubtless there have been cases where responsible people have escaped punishment through the plea of insanity, while other have been improperly committed to asylums.

At the same time, we should not be hasty in condemning experts, unless there is strong evidence of their insincerity or incapacity. For they stand in a trying position. The brief description above given is sufficient to show how difficult may be the problem of drawing the line infallibly between sanity and insanity, between responsibility and irresponsibility. Mere evidence of irrational words or acts is not conclusive, for few people always act rationally. Neither is evidence of cerebral disease or injuries conclusive, for they do not necessarily destroy self-control.

That brings in the great question of self-control, which is more psychological than physiological. At what point does it cease? So long as self-control can be maintained, the responsibility of the patient continues. People who commit crime often claim that they "could not help it," they were "driven by an irresistible impulse," and so on. Such statements should be given little credence, for their motive is obvious. It is significant that these same people who "could not help it," could exercise sufficient self-control to wait for a favorable opportunity for committing the crime without danger to themselves, could even plan it a long time ahead. In other words, they had plenty of self-control so long as it suited them to exercise it.

Judge and Jury.—Worse still is the responsibility of the men who must pass final judgment in view of the law and the evidence. On the one hand is the humane desire to save a human being from close confinement or the gallows; on the other, is the stern duty to protect the community from one who is actually irresponsible, or who is merely pretending irresponsibility in order to shield himself from just punishment or restraint. That would be difficult enough even if the case were presented fairly and squarely on its merits; but, of course, that is never done; every cunning trick is employed to deceive both experts and jury as to the defendant's real condition. The final decision involves a fearful responsibility, requiring judgment and conscience of the highest order.

SUICIDE.

Self-murder is terribly on the increase in all parts of the world from which we have statistical reports. That this should be true of Europe is not so strange, where the common people are taxed to support vast armies and a large privileged class of aristocracy and officials, and are required to waste several of the best years of each man's life in military service. That is the regular thing, frequently diversified by a bloody war or massacre, or by a famine from failure of crops or employment. The condition of the common people in parts of Russia, Ireland, and England is beyond anything ever seen in the United States for abject misery and destitution, and the wonder is that, in spite of it all, they still cling to life. Suicide is most common in Dresden, Paris, Berlin, Genoa, Lyons, Vienna, Stockholm, Christiania, and London. In the first two the proportion of suicides to population is twice as great as in New York or Chicago.

But in this great, free, prosperous land, it seems as if there were no occasion for suicide. Yet self-destruction in the United States is increasing rapidly, especially in the cities. In the fifty leading cities there was an increase of thirty-one per cent in population in the ten years ending with 1902, while the number of suicides in those cities increased from 1,465 to 2,452, or more than seventy per cent.

The Causes of this frightful increase are, of course, numerous. They include all the vice, folly, and crime of which poor, weak human nature is capable. Foremost stands alcoholism, with all its attendant train of miseries. The weak will, which in the first place gave way to the temptation of the sparkling glass, being still further weakened by long continued indulgence, falls before the feeblest breath of adversity, disappointment, or even weariness of life. Other causes are despondency, business fail-

ure, ill health, grief, domestic trouble, love quarrels, disgrace, and insanity.

Although Never Justifiable, some cases of suicide are far more inexcusable than others. Thousands take their own lives for alleged reasons which brand them at once as contemptibly lacking in moral and mental stamina. As examples may be cited the case of the young man of twenty-five who shot himself at home just before the family were to sit down to Thanksgiving dinner for the "reason" that he had been out of work three weeks! How many men have been out of work months or years, and still fight bravely on! A man over eighty killed himself because he was so well off that he was afraid he should not have any work to do! A schoolgirl killed herself because her mother scolded her! A youth of nineteen shot himself because a sixteen-year-old girl would not promise to marry him and because he feared he could not get rich quick enough! A Missouri farmer leaped into the dread unknown because of worry over having more money than he could invest! Such idiocy seems incredible, yet its frequency proves how much suicide is utterly inexcusable and comtemptible.

These Are Fair Samples of the weak and morbid people who contribute a large part of the statistics. Maudlin self-pity and impatience of a little disappointment; an overweening egotism which must have everything its own way and right away; utter poverty of mental resources, moral principle, or sturdy self-reliance; a selfish disregard of others' rights, all explain the number of weaklings who desert the battle of life. Such renegades deserve no sympathy, for their desertion is without excuse. The real reason, which they fail to give, is that for years they have been indulging themselves in weak and silly brooding, instead of doing their best to discharge their duty and rise superior to the ills of life.

The Moral is Evident—don't brood; don't allow yourself to grow morbid; don't be silly. Almost every one has had periods of depression, commonly called the "blues," in which he felt strongly impelled to pity himself, and imagine how the notice of his death would read in the newspapers, and how many people would say: "Poor fellow! We shall miss him sadly." And, if you are in love, you may be moved to maudlin tears at the mental picture of Her inconsolable grief when she perceives that she has trifled with your affections just a little too long, and now it is forever too late!

Don't You Believe It.—Most of the few people who would pay any attention to a notice of your suicide would say: "What a fool! He

could not have 'blown his brains out,' for he never had any." As to Her wasting any grief over you—well, you will do best to stay in ghostland and not try to come back to observe her devotion to your memory.

The Best Cure for that kind of foolishness is to get outdoors and take a lot of exercise. Probably what ails you is eating too much, or biliousness. If possible, do some real hard work, preferably for the benefit of some one who needs help; otherwise, walk and run several miles. When you get home again, you will be surprised how the cobwebs have been swept out of your brain.

Ennui.—Closely associated with maudlin self-pity, is simple weariness of living. This may come from having too much or too little; usually it is the latter. It is the unhappy portion of those who have neglected to improve their minds by study and good reading, and to enrich their souls with high ideals and ambitions. An animal may live very contentedly for any number of years on the satisfaction of the senses only, but an immortal soul must have something higher. Inevitably there comes a day when costly food and drink, jewelry, fine raiment, display and excitement, all the pride and pomp of fashion are naught but vanity and vexation of spirit. The jaded senses refuse to respond to the strongest or most cunning incitements.

Then life becomes an awful blank. The victim of ennui is ready to do anything to get away from self, even to try to hide from self in the grave. Poor fool! Yourself is the one dreadful thing you must take always with you through all eternity! If you could have said with Sir Walter Raleigh, "My mind to me a kingdom is," you would have had a sure refuge from all the weariness of life.

The Ancients.—In all this there is nothing especially new. In all the centuries, human pride and folly have always run the same course. It is recorded that Zeno, founder of the Stoics, hung himself because he fell down and put his finger out of joint. Empedocles is said to have jumped into Mount Etna, in order that it might be supposed that he had been translated miraculously to the gods. Sardanapalus, king of Assyria, being weary of life, resolved to make a grand exit in the most spectacular manner and with plenty of company. Having invited his favorites to a sumptuous banquet in a magnificent palace, he had it all set on fire in the midst of the carousing, so that he and all his guests went up in flame and smoke.

Of a Different Kind are the suicides which are caused by poverty, long sickness, distress, disgrace, desperation, or domestic troubles. Although not justifiable they are not contemptible. They indicate a defi-

ciency of moral stamina. They result from a false view of life, its duties and responsibilities. It is a pleasant philosophy that we are here to have a good time, that "the world owes us a living," but it is a false and dangerous philosophy. The cold truth is that the world owes us nothing. The sooner we recognize and accept that fact, the better will it be for our peace of mind and health of body.

Neither are we here for a good time. On the contrary, we are in the primary and grammar grades of an educational course of which the high school and university are to be entered through the door of death. We are here to learn as fast as possible the great lessons of life—goodness, generosity, courage, patience, industry, and all the rest of it; these can never be learned by having a good time. They must be learned by bearing pain and trouble bravely and patiently, by rising superior to petty emergencies, by forgetting our own woes in comforting others, by a dogged determination to "win out" some day or other in spite of every discouraging obstacle. That spirit will never fly to suicide for relief.

The Punishment.—The self-destroyer is therefore a shirk. He or she seeks to escape learning the lessons of life, like the child who plays truant because he does not like to study in school. Just what their punishment will be in the next life, it is impossible to guess, but there can be no doubt that there will be some punishment to fit the offense of those who presume to thrust themselves into the next higher grade before they have proved themselves fit.

The Statistics of Suicide reveal some remarkable facts. Referring again to the statistics of the fifty cities, it is found that in those ten years more than three times as many males as females committed suicide. That is not very creditable to the courage and endurance of the men. Remember that no one is ever a failure until he quits trying.

More persons living alone than married killed themselves. It is not good that man—or woman—should be alone. Strange to say, most deserted the battle between the ages of thirty and forty, when strength and wisdom should be greatest; and the next greater number between twenty and thirty, when courage and ambition should be highest. Really old men, over seventy, kill themselves least of all.

BOOK IX.

SPECIAL SYSTEMS OF TREATING DISEASE.

HOMEOPATHY.

Homeopathy is the name given to a system of medicine in 1806 by its founder, Samuel Hahnemann. After graduating in medicine from the University of Erlangen, Dr. Hahnemann settled in Leipsic, and afterward had direction of a large hospital in Dresden.

In 1790 he was struck by the significant similarity of the effects of quinine and some other drugs on the healthy body, to the disease symptoms for which they were commonly prescribed. Believing that he had hit upon a new and valuable principle in medicine, he pursued the subject zealously, and found such confirmation of his theory that he announced it to the world in 1796.

His Great Work, "The Organon of Rational Medicine," came out in 1810, and has ever since been the guide and authority of his followers. In 1835 he settled in Paris, where he enjoyed great reputation, until his death in 1843. During that period the French capital naturally became the Mecca of Homeopathists from all over the world.

The new treatment spread rapidly in spite of much opposition and some persecution. Naturally the old-school physicians were opposed to the innovation, and they had the active sympathy of the apothecaries, since Hahnemann insisted on the single remedy and the minutest dose possible. While he was at Leipsic the apothecaries' company got an act passed forbidding physicians to dispense their own medicines, and in consequence Hahnemann was obliged to leave. The conflict between the two systems—called Homeopathic and Allopathic by the followers of Hahnemann—was exceedingly bitter for a long time, many names were called, and harsh things said on both sides; but now they have agreed to disagree in peace, and often work in harmony.

Homeopathy in the United States has been especially prosperous. Its first college was established at Allentown, Pa., in 1835; and in the same year the *American Journal of Homeopathy* was started. Nine years later was organized the American Institute of Homeopathy, the oldest national medical association in the country. There are now in the United States about 15,000 Homeopathic physicians, and eighteen medi-

cal colleges in which their therapeutics are taught. Many of these include in their courses of study all departments of medicine and surgery, with excellent clinical and hospital equipment.

Homeopathy is a Large Subject, and only the essential features can be noticed in this place. As given in the Organon, they are—Proving of drugs upon the healthy; Prescription according to the law of similars; Single Remedy; and Minimum Dose.

Although Hahnemann himself insisted upon all four, his followers have varied in regard to the third and fourth principles; many maintaining that the essentials of Homeopathy are comprised in the first and second. The law of similars—which Hahnemann expressed concisely as *Similia similibus curantur*—means that a disease can be cured by that medicine which, when given to a healthy person, will produce symptoms most similar to those of the disease.

Provings.—The administration of medicines to healthy persons, in order to record the symptoms produced, is called "proving," and the symptoms are called "provings." Hahnemann and his immediate disciples proved ninety drugs in this way, and the work has been carried out enthusiastically since then, so that now the Homeopathic materia medica contains over 400 proved remedies. About half of these are in constant use.

That Fact Alone is sufficient to prove that no physician can be a competent Homeopathist who is not, like the founder, a profound student and a keen observer. The popularity and novelty of the system caused many to adopt the name who were merely shallow imitators, and lacked both industry and capacity for mastering the system. Until recently the laxity of government supervision of the practice of medicines made it possible for almost anyone to hang out a sign as a "Homeopathic Physician and Surgeon," and thus great discredit has been brought upon the name. But, in spite of this, the devoted and successful service to the sick, which has been rendered now for a century by thousands of capable Homeopathic practitioners, has overcome popular prejudice and professional opposition and has raised this school of medicine to a high rank. Last of all, it has received official recognition, and now it is allowed to share in the medical treatment and administration of many public institutions.

The Number of Homeopathic general and special hospitals in the United States is ninety-six; sanitariums, sixty-one; other institutions, fifty-nine; dispensaries, fifty-six. The number of general and special hospitals where both schools of practice are represented is forty-two;

other institutions, nine. Number of Homeopathic national societies, nine; state societies, thirty-five; local societies, ninety-eight. Homeopathic journals, twenty-four.

The Greatest Good—Of all the good things which Homeopathy has accomplished, probably the greatest is the reduction of the medicinal dose. In this gain all schools have had a share. No physician of any school now would think for a moment of prescribing the enormous doses and severe treatments which were customary in the time of Hahnemann. Part of this improvement must be credited, no doubt, to the general progress of intelligence among both profession and laity; but the greater part is due to the continual object-lesson of Homeopathic precept and practice for the last hundred years.

HOMEOPATHIC TREATMENT OF DISEASE.

ABSCESS.—First stage, before pus has formed, give *Belladonna*, 3 x, and *Mercurius Viv.*, 6 x, in alternation. When pus begins to form, give *Hepar Sulphuris*, 3 x.

Sulphur, cc, is useful to remove a tendency to abscesses. Poultice and open freely as soon as suppuration takes place. After opening, wash out the abscess with *Tinct. of Calendula*, one part to ten of water.

ABSCESS, OF THE EAR.—It is so liable to extend to the brain that a surgeon should be called early. The same remedies as above.

ACUTE INFLAMMATION OF THE BOWELS (Enteritis).—*Aconite*, 1 x, quick, wiry pulse; dry, hot skin, and very restless. *Arsenicum*, 3 x, burning pain in bowels; tongue red and dry; yellow, frequent stools; vomiting; very weak and debilitated.

Colocynth, 2 x, violent, griping pain in the bowels.

Veratrum Alb., 1 x, cold sweat; cramps in legs, with vomiting and diarrhœa.

Keep hot packs of alcohol and water over the bowels and call a physician.

Avoid all animal food.

ANAEMIA.—*Ars.*, 3 x, green sickness, when the result of a perverted nervous action.

China, 3 x, resulting from excessive loss of blood or any debilitating discharges.

Ferrum, 1 x, deficiency of red blood globules. A change of climate, scene, air, etc., is often very beneficial.

APOPLEXY.—Give *Aconite*, 3 x, and send for medical assistance. Principal remedies are *Aconite*, 3 x, *Belladonna*, 3 x, *Opium*, 30, *Arnica*, 3 x, and *Glonoine*, 30.

Aconite, 3 x, hard wiry pulse; persons of full habit.

Bell., 3 x, congestion of the brain; red, swollen face; throbbing of blood vessels; dilated pupils, convulsive movements of the face and limbs, serviceable early in the case.

Opium, 30, profound stupor; dusky countenance; contraction of pupils; convulsed; moans and groans; cannot be aroused.

Arnica, 3 x, after active excitement has subsided, to promote resorption of effusion.

Nux Vomica, 3 x, is a useful remedy to prevent a predisposition to apoplexy. The diet should be plain, avoiding rich food and stimulants. Exclude all excitement, over-exertion, sudden changes of temperature, and excesses of all kinds.

ASIATIC CHOLERA.—*Camphor* ϕ, great depression; collapse; chilly most of the time; violent vomiting and purging; give early in the disease.

Arsenicum, 3 x, excoriating discharges; bright red tongue, with burning of stomach and bowels; patient wild and restless; useful in all stages of the disease.

Veratrum Alb., 1 x, cold sweat; violent vomiting and purging; cramps of different muscles of the body.

Cuprum Aceticum, 30, also for cramps with empty retching: also to be used as a prophylactic.

The diet should be milk with a little brandy added.

ASTHMA.—*Arsenicum*, 3 x, *Euphorbia Pilulifora*, 1 x, *Ipecac*, 1 x, *Veratrum Viride*, 1 x.

Arsenicum, 3 x, hay-fever, watery excoriating discharges from the eyes and nose.

Euphorbia Pil., 1 x, suffocative cough; considered a specific by many.

Ipecac, 1 x, nausea and vomiting, followed by violent fits of coughing.

Veratrum Vir., 1 x, hard, difficult breathing; tight, wheezing cough; full, hard, bounding pulse.

BACK, LAMENESS (Lumbago).—*Rhus Tox.*, 3 x, for painful condition of the muscles from a sprain or wrench.

For crick of the back, *Ferrum Phosphoricum,* 3 x.

BALDNESS.—To prevent the hair from falling after fevers, etc., *Fluoric Acid,* 6 x, and *Silicea,* 30.

BARBER'S ITCH.—*Sulphur Iodide,* 3 x, every six hours, and apply Blue Ointment.

BILIOUS OR REMITTENT FEVER.—*Gelseminum,* 1 x, the leading remedy for remittent fever; pain in the head on the left side.

Bryonia, pain on the right side of the head, extending to its base; yellow coated tongue; sallow complexion; constipation or alternate constipation and diarrhœa.

Merc. Protoide, 3 x, jaundice during the fever.

Phosphorus, 3 x, may be given if there is a cough at the same time of the jaundice.

BLEEDING FROM THE NOSE (Epistaxis).—*Aconite,* 1 x, for plethoric persons, with hard, quick, wiry pulse.

Carbo Veg., 3 x, severe nosebleed, several times daily, with pale face before and after each attack.

Nitric Acid, 3 x, disposition to nosebleed.

BLEEDING FROM THE LUNGS (Hemoptysis).—*Hamamelis,* ϕ, ten drops, every hour, for dark blood which is profuse or scant.

Veratrum Vir., 1 x, congestion of the lungs, with full, hard, bounding pulse.

Phosphorus, 30, disposition to frequent hemorrhages with dry, hacking cough.

BRONCHITIS.—*Aconite,* 1 x, at commencement, with hot, dry skin and quick pulse.

Bryonia, 3 x, bronchial tubes feel sore; dry cough, also, at commencement, may be given alternate with *Aconite.*

Sambucus, 1 x, very useful for young children.

Verat. Vir., 1 x, full, bounding pulse; difficult breathing, also *Antimonium Tart.,* 3 x, *Kali Bichromicum,* 3 x, and *Ipecac,* 1 x.

Keep the chest wrapped in cotton batting.

CANKER OF THE MOUTH.—*Merc. Cor.,* 3 x, one of the best remedies.

CATARRH.—*Aconite,* 3 x, acute catarrh, feverishness; pain in the head, eyes, nose, etc.

Bryonia, 3 x, in addition to the acute catarrh of the nose, it has a dry cough with stitches in the chest.

Kali Hydroidicum, 3 x, sneezing; watery discharges from the eyes and nose which excoriates; pain in the fore part of the head.

CESSATION OF MENSES.—At this time women are subject to "hot flashes." *Lachesis,* 30, profuse menses from granular trouble of the mucous membrane and other troubles. At this time women needs the care of an able physician, and should consult him frequently, if everything is not perfectly normal.

CHAPPED OR CRACKED LIPS.—*Bryonia,* 3 x, dry, chapped lips.

CHICKEN POX (Varicella).—*Aconite,* 3 x, fever; restlessness; generally all the remedy needed.

Antimony Tart., 3 x, if the eruption suppurates, this remedy will be useful to prevent scars.

Hepar Sulphur, 3 x, useful for a week or so after any of the eruptive diseases.

Milk diet the best.

CHOLERA MORBUS.—Same remedies as Asiatic cholera, adding *Colocynth,* 2 x, for violent, griping pain in the bowels.

CHRONIC CATARRH.—*Calc. Carb.,* 30, *Kali Bichromicum,* 3 x, *Sanguinaria,* 3 x, *Sulphur,* cc.

COLIC.—*Colocynth,* 3 x, is generally the first remedy called for.

Plumbum Carb., 30, long continued colic with constipation.

Chamomilla, 30, colic during dentition.

CONCUSSION OF THE BRAIN.—Keep the patient quiet; apply cold cloths to the head and give *Arnica,* 3 x, every hour or two, for a few days.

CONGESTION OF THE BRAIN.—*Belladonna,* 1 x, full, beating blood vessels; full pulse; red, flushed face; mild delirium; dilated pupils.

Bromide of Potash, five grains, every hour, to an adult, until better.

Veratrum Vir., 1 x, full, bounding pulse; nausea with terrible pain in the head.

CONSTIPATION.—*Nux Vom.,* 3 x, where the trouble arises from an inaction of the muscular coats of the intestines.

Opium, 30, stool hard, composed of small hard balls. *Bry.,* 3 x, is given for alternate constipation and diarrhœa. If the child is taking cow's milk, salt it. Do not give physic; and if the above remedies do not cure, go to a physician.

CONVULSIONS (Fits).—*Belladonna,* 3 x, flushed face; throbbing of the blood vessels going to the head.

Cicuta Virosa, 6 x, twitching and jerking of the muscles all over the body; movement of the muscles about the mouth causing a chewing motion.

Gelseminum, 1 x, violent fever; full compressible pulse. The whole body is convulsed.

COSTIVENESS (Constipation).—*Nux Vomica,* 3 x or 30, useful after using much cathartic medicine; persons of sedentary habits, no desire for stool, and, if there is, it cannot be accomplished.

Plumbum, 30, stools of hard, small balls, frequent attacks of colic.

Sulphur, cc, remedies do not give desired effect; piles, with burning pain in rectum.

Drink a glass of oatmeal water, every morning, on rising.

COUGH.—*Aconite,* 1 x, croupy cough; spasmodic cough.

Bryonia, 3 x, hard, dry cough, with pain in head and chest.

Belladonna, short, dry, hollow, convulsive cough, worse at night; flushed face and cerebral congestion.

Hepar Sulph., 3 x, irritating cough; hoarseness, excited by exposure to cold. Rattling of mucus in the throat; croup.

Kali Bichro., 3 x, cough, with tough, stringy expectoration.

Phosphorus, 30, dry cough with tickling in the throat. Worse from talking or reading aloud.

Spongia, 1 x, dry, hoarse, croupy cough, with pain in the larynx. Alternate with *Aconite,* in croup, every fifteen minutes.

Castanea Vesca, 1 x, five drops, every two hours, in whooping cough.

Cuprum Aceticum, 30, also useful in whooping cough so violent as to often throw the patient into convulsions. (See also Asthma.)

Cramp.—*Cuprum Aceticum,* 30, a very useful remedy.

Cramp of the Legs.—Relieved by *Cuprum Acet.,* 6 x.

Cramp or Spasm of the Stomach (Gastralgia).—*Dioscorea,* 1 x, five drops every fifteen minutes.

Nux Vom., 3 x, and even ϕ, five drops, three times daily, will generally cure the disposition to cramp of the stomach.

Bryonia, 3 x, useful if the cramp comes on immediately after eating.

Lactopeptine, ten grains after each meal.

Croup.—*Acon.,* 1 x, and *Spongia,* 3 x, alternately, for spasmodic croup.

Defective Appetite.—*Bryonia,* 3 x, if caused by a torpid liver, also *China,* 6 x.

Nux Vom., 1 x, from anxiety; overworked nervous system and constipation.

Apply to a physician to ascertain cause.

Delayed Menstruation.—If caused by a cold or wetting the feet at a previous period, give *Acon.,* 1 x, particularly if the patient is feverish and has congestion of the head, also in young girls who are away from home, at school, etc.

Puls., 3 x, will generally restore the menses or bring them on when suppressed.

Sanguinaria, 3 x, when delayed menses are accompanied by a cough, neuralgia of the head, bleeding from the nose and cramp in the stomach, etc.

Senecin, 3 x, cough with suppression of the menses.

Diabetes.—*Uva Ursa,* 1 x, ten drops every three hours in *Diabetes Insipidus.*

Diabetes Mellitus.—*Arsenicum,* 3 x, very hungry and thirsty; pale skin; loss of strength; dryness of mouth and throat; excessive urination; watery diarrhœa.

Phosphoric Acid, 1 x, loss of nerve force, with frequent urination.

Gratify the thirst by an abundance of good water or skim milk. The diabetic should be warmly clad.

Diarrhœa.—*Camphor* ϕ, sudden diarrhœa with chilliness.

Dulcamara, 3 x, diarrhœa caused from getting wet; worse at night, bilious stools.

China, 1 x, painless, summer diarrhœa.

Chamomilla, 30, diarrhœa in children, accompanying teething.

Arsenicum, 3 x, chronic diarrhœa; red, burning tongue; vomits—even a small amount of water, in fact, everything taken into the stomach.

Ipecac, 1 x, diarrhœa and dysentery accompanied by much nausea.

Veratrum Alb., 1 x, vomiting and diarrhœa attended with cold sweating; cholera morbus; cholera infantum.

Avoid all animal food during an attack of diarrhœa. A little brandy may be added to milk with benefit.

Dilatation of the Heart.—*Digitaline,* 3 x, will strengthen a weak heart.

Phosphorus, 3 x, valuable as a tonic, giving tone to the system.

Diphtheria.—Call your physician. *Apis Mel.,* 3 x, in diphtheria with much swelling of the throat, internally, and a stinging pain.

Phytolacca Dec., 1 x, violent fever, with much stiffness of the neck, early in the disease.

Mercurius Cor., 3 x, much swelling of the throat externally; the membrane is very offensive.

Kali Bichromicum, 3 x, croupous diphtheria, with tough, stringy mucus.

In connection with the *Kali Bich.,* 3 x, use a spray of a *solution of Chloride of Lime* and hot water: one part of the solution to ten parts of hot water. Use a steam atomizer.

Never swab the throat, but use gargles of alcohol and water.

Diseases of the Heart.—Inflammatory diseases require *Acon.,* 1 x, for fever; quick wiry pulse; pain and anguish, and with this may be alternated *Bry.,* 3 x, if caused by rheumatic poison.

Arsenicum, 30, burning pain, with effusion in the sack; suffocative attacks; coldness of the surface; anxious and fears death.

Cactus, 2 x, a feeling in the heart as though grasped by an iron hand.

Veratrum Vir., 1 x, strong, loud beat of the heart, with difficult breathing; bronchitis.

Diseases Occurring During Pregnancy. —*Morning Sickness* (Nausea). This is generally relieved by *Nux,* 3 x, and to be given for faintness and nausea with constipation.

Bry., 3 x, is also a valuable remedy, where the nausea begins or is made worse by moving about; must lie in bed or she will vomit. This is a reflex action of the sympathetic nerves, the real cause being congestion and often ulceration of the uterine neck. A small amount of hot water (one

pint) may be used by vaginal injection once daily, to which may be added *Hamamelis* or *Borax*.

Diseases of the Spinal Cord.—Seek professional advice at once.

Acon., 1 x, for the fever and anxiety.

Gels., 1 x, patient is very nervous, with convulsions.

Cicuta Virosa, 6 x, violent convulsions from irritability of the spinal cord.

Dizziness (Vertigo).—*Digitaline*, 3 x, for dizziness caused by an enfeebled heart which has produced anæma of the brain.

China, 1 x, caused by loss of blood or severe diarrhœa.

Many other remedies are indicated from special causes which can only be located by a physician.

Dropsy.—*Arsenicum*, 3 x, a very useful remedy in dropsy with much debility; red tongue and much thirst for cold water, but a small amount satisfies.

Digitaline, 3 x, heart dropsy, more particularly, but useful in any kind, from whatever cause.

Helleborus Nig., 3 x, dropsy of the brain; after scarlatina, etc. Skim-milk diet useful in dropsy from kidney disease.

Dysentery.—*Aconite*, 1 x, very feverish; quick, wiry pulse at the commencement of the trouble; if the discharges are principally of blood, alternate with *Merc. Cor.*, 3 x, every half hour.

Ipecac, 1 x, nausea and vomiting, with bloody, greenish stools; it also quiets tenesmus.

Arnica, 3 x, dysentery, attended by much urging to go to stool. Injections of very hot water, after each stool, will relieve. Avoid all animal food; cold milk best article of diet.

Dyspepsia (Indigestion).—*Arsenicum*, 3 x, caused by ice cream; burning in stomach; red tongue; thirst; the least swallow of food or drink causes pain.

Bryonia, 3 x, sense of pressure as from a hard lump in the stomach; bitter taste with headache.

Carbo Veg., 3 x, much gas in stomach.

Hydrastis, 1 x, for pain coming in two or three hours after meals.

Lactopeptine, five to ten grains after each meal, is useful to help the stomach until it regains its functions. Eat slowly, masticating the food thoroughly. Avoid such articles of food as are known to disagree.

Earache (Otalgia).—*Aconite*, 1 x, from cold; patient very restless.

Puls., 3 x, steady pain, but does not drive the patient about as *Aconite* does.

Aconite, ϕ, two or three drops on cotton, in the ear, very useful.

Tobacco smoke, blown into the ear, will ease the pain.

Enlargement of the Uvula, which is relaxed, *Hyoscyamus*, 1 x, every two hours. A tea of Gold Thread useful as a gargle.

Epilepsy (Falling Fits).—To ward off an attack use *Nitrite of Amyl*, by inhalation.

Bell., 3 x, holds a high place in chronic epilepsy of young and full blooded subjects.

Cuprum Acet., 30, violent convulsions; pale face.

Nux Vom., 3 x, useful as a tonic to the nervous system.

Erysipelas.—*Aconite*, 1 x, erysipelas of the face, with a quick, wiry pulse.

Belladonna, 3 x, intense redness of the skin; high fever; smooth surface; violent headache; delirium.

Rhus Tox., 3 x, vesicular, purplish colored skin. Powder with dry starch or flour.

In the phlegmonous variety, call a physician.

Exhaustion.—If caused by hemorrhage, diarrhœa, etc., nothing is better than *China*, 1 x. If from non-assimilation of food, give *Calc. Phos.*, 3 x.

Arsenicum, 3 x, useful for indigestion, with burning of the stomach, also from the effects of typhoid fever.

Phosphoric Acid, 1 x, nervous exhaustion from excesses. Beef tea is useful; use also milk.

Eyes.—For simple inflammation of the eyes, the white of the eye being red, give *Bell.*, 3 x, every two hours. For hot, scalding, watery discharge from the eyes, *Kali Hydroidicum*, 3 x. A cinder or any foreign body in the eye should be early removed. Any trouble causing severe pain in the eye is serious, and an oculist or good surgeon should be consulted.

Fainting (Syncope).—*Aconite*, 30, the best remedy to prevent its frequent occurrence. *Aqua Ammonia* or *Spirits of Camphor*, by inhalation, are restoratives; also sprinkling water in the face.

Falling off of the Hair.—*Silicea*, 30, will stop the hair from falling off after a severe sickness, which has caused debility. At the same time a wash of Bay Rum and water, two ounces of each and Aqua Ammonia, one drachm, will be found useful.

Falling of the Womb.—A result of either a ruptured perineum or an increased weight from above (tumors, enlargement, etc.). The treatment is principally mechanical and surgical.

Lilium Tig., 30, much used in these troubles.

Felons.—*Belladonna*, 3 x, for redness of the finger, with throbbing pains after suppuration has taken place. *Hepar Sulph.*, 3 x, will hasten a cure. Have it opened, early; by so doing you will save much suffering, and, possibly, the loss of a finger.

Fevers, in General.—*Aconite*, 1 x, give the remedy when you find a quick, firm, hard, wiry pulse.

Baptisia Tinct., 1 x, give this for a quick, fine, soft, compressible pulse; typhoid fever; diarrhœa, etc.

Gelseminum, 1 x, give for a full, bounding pulse, that is compressible and does not resist the finger.

Veratrum Vir., 1 x, full, hard, incompressible pulse and resists the finger.

Fever and Ague (Intermittent or Malaria).—*China, Quinine*, in recent ague, never in chronic cases, all the stages are well marked, the chill is usually in the morning from nine to ten.

Arsenicum, 3 x, chronic ague; one stage runs into another, often one stage is left out; very thirsty; rapid and excessive prostration; dropsical swellings.

Eupatorium Perf., 1 x, thirsty several hours before a chill and continues through it; short chilly stage; long hot stage and slight sweating.

Phos. Acid, 1 x, very profuse sweat.

Gels., 1 x, severe nervous symptoms.

Natrum Mur., 30, chronic ague. *Arsenicum*, 30, *Ipecac*, 3 x, *Cedron*, 3 x, *Sulph.*, 30, for dumb ague.

Foetid Breath.—*Salicylic Acid*, 3 x, a powder, three times daily, will correct it, when the stomach is at fault. Decayed teeth should be filled or removed.

Gallstones.—Where a person is known to suffer from these concretions, give six tablespoonfuls of *Olive Oil*, at bedtime, repeated in two days, at the same time give *China*, 6 x, a dose three times daily, and it will rarely fail to cure. An anesthetic will give the only relief while they are passing through the gall duct.

Gangrene, Mortification.—Remove it when possible by amputation, if it be of a limb, from injury. A superficial slough can be treated by a flaxseed meal poultice, to which add charcoal. A poultice made from crushed, boiled carrots, is also a good one.

Internally, give *Arsenicum*, 3 x, every two hours, if there is much burning about the slough.

Secale, 3 x, for dry gangrene of the toes. A weak solution of Carbolic Acid, ten drops to one pint of hot water, should be used as a wash.

Glandular Swellings.—When as a result of diphtheria, put on salt pork, and give *Merc. Protoide*, 3 x, internally. When from a cold, *Hepar Sulph.*, 3 x, is generally the remedy. If from scrofula, *Calc. Phos.*, 3 x, and *Calc. Iodide*, 3 x, are the best remedies.

Gout.—The leading remedy is *Colchicum*, 1 x, five drops every three hours; avoid highly seasoned and animal food, liquors of all kinds.

Gumboil.—*Bell.*, 1 x, will often remove the inflammation that leads to a gumboil.

Merc. Viv., 3 x, when caused by a decayed tooth.

Open as soon as pus forms.

Hay Fever (Asthma).—*Arsenicum*, 30, is the chief remedy. *Sanguinaria Nitrate*, 3 x, will often help when there is severe sneezing and a watery condition of the eyes.

Headache.—Bilious or sick headache will call for *Iris Vers.*, 3 x, or *Cocculus*, 30, at the time of the pain, taking *China*, 30, or *Nux Vom.*, 3 x, twice a day at other times. *Congestive* headache requires *Bell.*, 3 x, if without vomiting; if with vomiting, *Veratrum Vir.*, 1 x, at the time. During the interval, take *Sanguinaria*, 30, or *Pulsatilla*, 30.

Hiccough (Spasm of the Diaphragm).—A few drops of vinegar on sugar will generally control it. *Moschus*, 3 x, is the homœopathic remedy. If occurring during the course of a severe illness, a tight bandage across the chest oftentimes prevents its reappearance.

Hip Joint Disease (Coxalgia).—*Bell.*, 3 x, when there is soreness about the joint discovered by pressure.

Calc. Carb., 30, twice daily; should be given steadily to correct the strumous condition.

Calc. Iod., 3 x, and *Calc. Phos.*, 3 x, for the same condition.

If from an injury, *Arnica*, 3 x, may be the most useful remedy. The joint should be placed at rest by patent splints, and the child placed under the care of a reputable surgeon.

Hoarseness.—*Causticum*, 30, from singing and over-use of the voice.

Spongia, 3 x, or *Kali Bich.*, 3x, when caused by croup.

Phos., 30, from the effects of a cold, always worse in the evening.

Hypochondria (See Hysteria).—*Nux Vom.*, 3 x, the most useful remedy.

Hysteria.—This is a perverted nervous action, generally arising from uterine or ovarian disease, and the cause must be found and properly treated to lead to a cure.

Gels., 1 x, very nervous, with hysterical convulsions.

Moschus, 3 x, useful in many of the symptoms, such as palpitation of the heart, cramp of the stomach, neuralgia, etc., of hysterical subjects.

Hysterical Convulsions.—*Nux Vomica*, 3 x, violent drawing backward of the head and feet toward each other.

Convulsions from passion, *Chamomilla*, 30: injury, *Hypericum*, 1 x: worms, *Cina*, 3 x, *Cicuta*, 6 x: fright, *Ignatia*, 30.

Incontinence of Urine.—Wetting the bed is very common during childhood. If caused by worms, or intestinal irritation, *Cina*, 30, will benefit.

Ferrum Acet., 3 x, in delicate blonde children.

Equisetum Hyemale, 3 x, is also a useful remedy to break up the habit.

INFLAMMATORY BLUSH (Erythema).—*Bell.*, 3 x, all the remedy required generally.

INFLAMMATION OF THE EAR (Otitis).—*Acon.*, 1 x, fever caused by cold. *Puls.*, 3 x, alternately with the *Acon.*

Hepar Sulph., 3 x, should an abscess develop.

INFLAMMATION OF THE EYE (Ophthalmia).—*Acon.*, 1 x, from cold; feverishness.

Bell., 3 x, acute redness of the conjunctiva or white of the eye. Keep hot compress on the eye, to which may be added *Bell.* ϕ, ten drops to a teacupful of hot water; compress to be wet in this solution. Use no eye washes. If not better in a few days, call your physician, for, if the deeper tissues are affected, you cannot diagnose it.

INFLAMMATION OF THE BLADDER (Cystitis).—*Aconite*, 1 x, acute pain, with fever, alternating with *Cantharides*, 3 x, which has constant or frequent desire to urinate, followed by severe pain.

Apis Mel., 3 x, stinging pain, when passing water, in the bladder. If the inflammation is caused by Spanish-fly blister, with severe strangury give *Camphor* ϕ, ten drops, every quarter hour, until better. Hot applications over the lower part of the abdomen should be made.

INFLAMMATION OF THE KIDNEYS.—*Acon.*, 1 x, feverish; quick, wiry pulse; restlessness. *Turpentine*, 1 x, high colored urine, scanty, sometimes bloody. Pain over region of the kidney.

Aconite, 1 x, alternating with *Turpentine*, 1 x, are generally all that are called for in acute inflammation of the kidneys.

INFLAMMATION OF THE LARYNX (Laryngitis).—*Aconite*, 1 x, for fever with croupy cough; restlessness.

Kali Bich., 3 x, if the *Aconite* does not succeed, this remedy generally will. Its use will be needed if there is an expectoration of stringy mucus. This is the remedy, *par excellence*, for membranous croup.

Spongia, 1 x, may be given alternately with Aconite at first.

Hepar Sulph., 3 x, a powder every four hours, very useful when the violence of the attack has subsided, leaving a rough, hoarse cough.

Tracheotomy may be called for where there is fear of suffocation; but when homœopathic remedies are given this is rarely essential. The steam atomizer may be called for also.

INFLAMMATION OF THE LIVER.—*Acon.*, 1 x, pain in the region of the liver, with high fever; quick, wiry pulse; restlessness.

Bryonia, 3 x, pain in the liver, worse upon movement; nausea and vomiting; yellow coating on tongue.

China, 6 x, one of the most frequent remedies called for in congestion of the liver.

Podophyllum, 1 x, chronic diarrhœa, worse in the morning, caused by an inactive liver.

Merc. Prot., 3 x, jaundice; yellow coated tongue; nausea, and often vomiting.

Phosphorus, 3 x, loathing of food, which, if swallowed, creates disturbances and is vomited after a few minutes.

INFLAMMATION OF THE OVARIES (Ovaritis).—*Acon.*, 1 x, and *Puls.*, 3 x, alternately. Hot applications externally, and very hot vaginal injections.

Apis Mel., 3 x, if the pain is stinging, worse on the right side. *Clematis*, 30, a deathlike, sickening pain. *Lach.*, 30, left sided pain.

INFLAMMATION OF THE PERITONEUM (Peritonitis).—A very dangerous disease; call your physician early.

Aconite, 1 x, from cold febrile symptoms with quick, firm pulse.

Veratrum Vir., 1 x, full, hard, bounding pulse; vomiting and often diarrhœa.

Belladonna, 3 x, sharp, cutting pains in the bowels, which come quickly, and disappear as rapidly as they come.

Bry., 3 x, second stage, exudation; pain in the bowels, aggravated from motion; tongue coated and dry; great thirst.

Colocynth, 2 x, severe, griping pain in the bowels. *Ars.*, 3 x, sudden sinking and prostration; restlessness; great thirst; tongue red. Keep the patient at rest, and use hot fomentations over the bowels.

For intense thirst and vomiting, small bits of ice are useful.

INFLAMMATION OF THE SPLEEN.—*Quinine*, 1 x, is the only remedy usually called for.

INFLAMMATION OF THE STOMACH (Gastritis).—*Arsenicum*, 3 x or 30, inflammation of the mucous membrane of the stomach, known by violently red tongue; burning pain in the stomach, and vomiting as quickly as any food enters the stomach.

Argentum Nit., 3 x, inflammation of the stomach, caused by ulcer of the stomach. Much gas in the stomach, with violent pain after eating. The diet should be of the simplest; milk, or milk and limewater.

INFLAMMATION OF THE TONSILS (Tonsilitis, Quinsy).—*Bell.*, 1 x, the first remedy thought of in quinsy. It may be followed by *Merc. Prot.*, 3 x, if the inflammation does not subside in forty-eight hours. Should the tonsil suppurate, give *Hepar Sulph.*, 3 x. Gargle the throat with hot water frequently.

INFLAMMATION OF THE TONGUE (Glossitis).—*Bell.*, 1 x, painful swelling of the tongue. This should be followed in forty-eight hours by *Merc. Viv.*, 3 x, if not better.

INFLAMED OR ULCERATED NOSE.—*Kali Hyd.*, 3 x, the only remedy usually called for.

INFLUENZA.—*Aconite*, 1 x, alternating with *Eupatorium Perfoliatum*, 3 x, for lameness and stiffness of all the muscles, joints, etc.

Bry., 3 x, will be called for later, where there is pain in the head; dry cough and pain in the chest.

Bell., 3 x, violent headache; red face; sore throat; redness of the eyes, etc.

IRRITABLE BLADDER (Frequent Desire to Make Water).—*Cantharis*, 3 x, will generally relieve. If the pain is stinging, give *Apis Mel.*, 3 x.

IRRITATION OF THE BLADDER.—Most frequent in women who have uterine displacements, and congestion of the neck of the womb. This should be corrected before any remedy will help, then give *Canth.*, 3 x, for frequent calls to urinate.

Sepia, 30, pain after urinating, with uterine congestion. Hot vaginal injections very good.

IRRITATION OF THE SKIN, ITCHING (Prurigo).—It may call for a variety of remedies. *Rhus Tox.*, if it is a burning itching, worse in bed.

Urtica Urens, 3 x, stinging, burning itching, which comes and goes frequently; nettle rash.

Arsenicum, 3 x, chronic itching of the skin, which is scabby and dry. See a physician.

IRRITATION OF THE SPINE.—Unless the result of an injury, is generally complicated by some uterine disorder.

Gels., 1 x, very useful where the patient is extremely nervous and sleepless; full pulse.

Nux Vom., 3 x, stiffness and rigidity of the spine; indigestion; constipation; pain in the back of the head and neck. Dry cupping and wet compresses to the spine are often most useful. Go to your physician and find the cause, and treat it from that point.

ITCH (Scabies).—*Sulphur Ointment*, externally, use a week, every night on going to bed, at the same time take *Sulphur*, cc, internally.

ITCHING OF THE GENITAL ORGANS (See Pruritus).—*Ars.*, 3 x, *Merc.*, 3 x, *Rhus Tox.*, 3 x, all good.

JAUNDICE.—*Aconite*, 1 x, feverish and restless.

Bry., 3 x, congestion of the liver; yellow, thick coated tongue; thirst and headache.

China, 6 x, result of gallstones, or a thickened condition of the bile; obstruction of the gall duct, very useful in malarious climates.

Phos., 3 x, indigestion; vomiting of food about ten minutes after it is taken.

Merc., 3 x, and *Pod.*, 1 x, may be called for later, if the trouble does not respond to the other remedies. Jaundice is generally caused by some organic disease of the liver.

JAUNDICE OF INFANTS.—*Acon.*, 3 x, will be useful if the child is feverish and very restless.

China, 6 x, constipation, with much bile in the system.

Merc., 6 x, skin very yellow; stools white (clay color).

Phos., 30, one of the best remedies when the child has a hacking cough.

LICE.—Apply oil of Bergamot to the scalp.

LOCKJAW (Tetanus).—The result generally of an injury to a nerve. The wound should be opened, and if the nerve can be found it should be divided.

Gels., ϕ, and *Veratrum Vir.*, ϕ, sixty drops of each added to two glasses each half full of water, and giving a teaspoonful every quarter hour, has relaxed the muscles and cured many cases. The disease is fatal in a large per cent of cases.

LUMBAGO.—*Rhus Tox.*, 3 x, if from getting wet or a strain.

MEASLES.—Usually a very mild disease; particularly under homœopathic treatment.

Acon., 3 x, during the first two or three days. Sneezing; hacking cough; fever and restlessness.

Bell., 3 x, much pressure of blood to the brain; mild delirium.

Cuprum Acet., 30, sudden disappearance of the eruption when only partially out.

Puls., 3 x, much running of a watery fluid from the eyes and nose; cough; diarrhœa, etc., one of the best remedies in this disease.

Sambucus, 1 x, if there is much bronchitis, give this remedy.

Hepar Sulph., 3 x, toward the end of the disease, to prevent sequelæ The same remedies are used in malignant or BLACK MEASLES, but a physician should be called, for any remedy in the Materia Medica may become necessary.

MEMBRANOUS CROUP.—*Kali Bich.*, 3 x, the best remedy. A Solution of Chloride of Lime, by inhalation. It often becomes necessary to perform tracheotomy.

MILK FEVER.—Seldom requires much, but if severe give *Acon.*, 1 x. Should the brain suffer and the patient talk in her sleep, *Bell.*, 3 x, will be suitable.

MILK LEG (Phlegmasia Dolens).—*Acon.*, 1 x, and *Puls.*, 3 x, alternately, will often cut an attack short at the beginning. *Extract of Hamamelis* is a good application, locally.

MUMPS (Parotitis).—*Acon.*, 1 x, *Puls.*, 3 x, and *Merc.*, 3 x, are the remedies.

Avoid taking cold and other remedies will not be needed.

NAUSEA.—*Ipecac*, 1 x, is generally all the remedy needed. Violent nausea and vomiting, when not controllable by ipecac, may find a remedy in *Antimony Tart.*, 3 x.

NEURALGIA.—*Acon.*, 1 x, from cold, with fever, in teeth and face.

Bell., 3 x, pain in the teeth and face, more particularly on the right side; red, flushed face.

Colocynth, 2 x, severe pain on left side of face.

Ars., 3 x, pain as of hot needles piercing through the skin; cases of a chronic nature.

Chelidonium Maj., 3 x, pain in right shoulder and side.

Phos., 3 x, severe, long-continued neuralgia of any part of the body. The application of heat is very beneficial.

Galvanism will often hasten the cure of the remedies.

Neuralgia of the Heart (Angina Pectoris).—*Amyl Nitrite,* by inhalation at time of attack.

Ars., 3 x, a very useful remedy to prevent the recurrence of an attack. Smoking should be stopped by those who suffer from the disease.

Nightmare.—A dose of *Nux Vom.,* 3 x, at bedtime will usually overcome the trouble.

Noises in the Ear (Tinnitus Aurium).—One of the best remedies is *Puls.,* 3 x, for this trouble.

China, 1 x, for noises in the ear as a result of losing a large amount of blood. Ear wax should be removed by putting a few drops of glycerine in the ear at night, for two or three times.

Obstructed Menses.—May be malformation and need the care of a surgeon. When caused by congestion, *Bell.,* 3 x, is the proper remedy. Hot vaginal injections, containing a few drops of Fluid Extract of Belladonna, may also be used.

Painful Menstruation (Dysmenorrhœa).—A very common trouble in flexions of the womb and disease of itself or its appendages. If acute and caused by a cold, *Acon.,* 3 x, will be the remedy. *Puls.,* 30, will be found to be an admirable remedy at the time of the pain, when ovarian.

Thuja Oc., 1 x, once a day during the intervals; congestion of the ovaries; a flexion should be overcome; a narrow canal should be enlarged.

Pains in the Side.—Relieved by *Acon.,* 1 x, and *Bryonia,* 3 x.

Painter's Colic.—Opium must be administered in one grain doses, every two hours, until better.

Kali Hydroidicum, 1 x, useful to eradicate the lead from the system.

Palpitation of the Heart.—*Acon.,* 3 x, when the result of fright; severe and prolonged anxiety.

Cactus Grand., 3 x, when due from fatty heart.

Coffea, 3 x, nervous palpitation.

Moschus, 3 x, severe and acute attacks.

Agaricus, 3 x, if due from excessive use of tobacco.

China, 3 x, if from tea drinking.

Palsy (Paralysis).—When acute, following an attack of apoplexy, *Arnica,* 3 x, will hasten the absorption of the blood in the brain.

Nux Vom., 3 x, and *Gels.,* 1 x, will restore the nerve stimulus to the affected muscles in many cases. *Faradization* is very useful.

Papulous Scall (Eczema).—The remedies most generally used are *Croton Tig.,* 30, for ulcerating skin.

Rhus Tox., 3 x, severe itching, with thickened, red skin.

Canth., 3 x, vesicular (watery) blisters on the skin.

Graph., 30, dry, cracked skin.

Ars., 3 x, old, chronic cases; dry, fish scaly skin.

Sulphur, cc, will benefit cases which have become chronic and do not respond to the other remedies. Ointments generally aggravate the trouble.

Paralysis, Agitans (Shaking Palsy).—Should be treated by a physician, as well as *Paraplegia* (paralysis of the lower extremities), as they are generally caused by some deep seated disease of the nerve centers.

Periodic Headache (Malarial).—May require *Quinine* to break it up: one dose of five, ten, or fifteen grains, the night before an expected attack, followed by *Ars.,* 30, once daily for a month or so. At the time of pain no remedy can equal *Gelseminum,* 1 x.

Headache from a diseased condition of the brain will require *Zinc Phos.,* 3 x, and sedatives prescribed by a physician.

Headache of young persons of sedentary habits, free indulgers at the table, can be promptly helped by *Nux Vom.,* 3 x, one dose daily, at bedtime. Nearly all forms are curable by homœopathic treatment.

Piles (Hemorrhoids).—*Aesculus Hip.,* 3 x, pain in the back; constipation and piles.

Collinsonia, 1 x, very useful for piles that protrude, with constipation.

Hamamelis, 1 x, bleeding piles, both internal and external.

Nux Vom., 3 x, and *Sulphur,* 30, have cured many cases, in alternation, *Sulph.* in the morning and *Nux* at night. Suppositories made from the above remedies are also very useful.

Pleurisy (Pleuritis).—*Aconite,* 1 x, and *Bry.,* 3 x, alternately. *Acon.,* 1 x, during the first two or three days, with fever, followed by *Bry.,* 3 x, for four or five days, and later, *Sulphur,* cc, to finish up the case. Hot poultices should be applied to the chest.

Profuse Menstruation (Menorrhagia).—*Calc. Carb.,* 30, the remedy most useful in the large majority of cases. Never take iron in such cases. If the above does not help, go to a physician for examination. One of the most frequent symptoms of *polypus, fibroid tumors, granular degeneration* of the mucous membrane of the womb, and even *cancer,* is the profuse menses. When the

flow continues all the time, and stops for a day or two and again returns (Metrorrhagia), depend upon it, your case needs the attendance of a specially trained physician.

PROLAPSE OF THE RECTUM.—*Nux Vom.*, 3 x, three times daily, will help it, also *Podophyllum*, 3 x, in the same way. It is often necessary to wear an instrument for a time. Go to a surgeon.

PUERPERAL FEVER.—A blood poisoning caused by absorption of offensive or putrid material, either by an abrasion of the vaginal tract, or through the uterine blood vessels. It should be prevented by using a warm vaginal injection, every twelve hours, containing a little *Calendula*, for two weeks. If at any time the lochial discharge becomes offensive, use *Carbolic Acid* enough to scent the water, and give *Kreasotum*, 4 x, internally. *Acon.*, 1 x, *Bell.*, 3 x, *Ars.*, 3 x, *Verat. Vir.*, 1 x, *Baptisia* ϕ, or 1 x, *Rhus Tox.* and *Radicans*, 3 x, and many other remedies are used, but without the proper cleansing of the vaginal tract, they are of little use.

PURULENT OPHTHALMIA.—*Merc. Sol.*, 3 x, and *Sulph.*, cc, will be all the remedies needed, generally. An eye wash of *Nitrate of Silver*, one-half grain to the ounce of water, should be used twice daily, until better.

A towel used by a person suffering from this disease should not be used by others, as the disease is infectious.

RETENTION, SUPPRESSION AND DIFFICULTY OF VOIDING THE URINE.—Apply hot cloths over the kidneys, and give *Acon.*, 3 x, every hour.

Canth., 3 x, will often succeed when *Acon.* fails. The case should be examined for any malformation.

RHEUMATISM.—*Aconite*, 1 x, characteristic fever, caused by cold; pain and restlessness.

Bry., 3 x, swelling of the joints, which are very painful and worse from moving about.

Merc. Viv., 3 x, obstinate inflammation of single joints, worse at night; deep pain, as if it were in the bones; profuse perspiration, but not relieved by it.

Puls., 3 x, subacute cases with little fever; pains shift rapidly from one joint to another.

Rhus Tox., fever; parts red and swollen; pains drawing, tearing, burning, feels worse when at rest and better from continued motion. Worse damp or wet weather.

Wrapping the swollen joints with cotton batting relieves the pain very much. A solution of *Bicarbonate of Soda* and hot water, for bathing, is also useful.

RHEUMATIC HEADACHE.—Calls for *Bry.*, 3 x, if worse by moving about and better at rest, but if better moving about and worse at rest, *Rhus Tox.*, 3 x.

Salicine, five grains every two hours, may be given with one of the other remedies.

RICKETS.—*Calc. Carb.*, 30, and *Calc. Iod.*, 3 x, *Kali Iod.*, 3 x, *Iodine*, 3 x, are the principal remedies for this defect of osseous nutrition.

RINGWORM (Herpes Circinatis).—*Sepia*, 30, one dose daily, for a week, will cure. *Cantharides* ϕ, locally, also will cure.

RUNNING OF THE EAR.—Apply to a surgeon.

Merc., 3 x, and *Hepar Sulph.*, 3 x, internally.

SCARLATINA ANGINOSA.—*Apis Mel.*, 3 x, great swelling of the throat, so much so that the blood cannot flow freely to and from the brain, which causes a comatose condition.

Merc. Iod., 3 x, great swelling of the glands about the throat externally; ulceration of the throat.

SCARLET FEVER OR SCARLATINA.—Simple scarlet fever should be treated by *Acon.*, 1 x, if there be much fever, with wiry pulse; restlessness, etc.

Bell., 3 x, is almost a specific for this form. It has red face; sore throat; slight delirium.

Rhus Tox., 3 x, much itching of the skin in connection with the symptoms under *Acon.* and *Bell.*

SCARLATINA MALIGNA.—*Ailanthus*, 1 x, very malignant cases, violent vomiting; severe headache; dark, red face; rapid, small pulse; high temperature; muttering delirium; dark, livid, miliary rash.

Cuprum Acet., 30, sudden retrocession of eruption, followed by vomiting; convulsions; rolling of eyes; distortion of face; stupor and delirium; brain severely affected.

Muriatic Acid, 1 x, severe ulceration of the throat.

For *Nephritis* and *Dropsy*, following scarlet fever, *Ars.*, 3 x, *Asclepius Syrica*, 3 x, *Apis Mel.*, 3 x, and *Terebinth.*, 1 x, are the remedies.

Give all other children in the house *Bell.*, 3 x, who have been exposed to the disease. The diet should be principally milk. All acids should be excluded. Keep a careful watch of the patient for a month or more and the child should not be allowed to return to school for, at least, six weeks.

SCIATICA.—*Acon.*, 1 x, fever, with restlessness, caused by a cold.

Bry., 3 x, pain is increased or brought on by movement.

Cimicifuga, 1 x, drawing, tearing pain over the course of the sciatic nerve.

Rhus Tox., 3 x, pain is better from warmth and worse during stormy and wet weather, better from shifting one's position.

Bry. and *Rhus* are the chief remedies.

Galvanism should be resorted to if the trouble does not yield readily to medicine.

SCROFULA (King's Evil).—*Calc. Carb.*, 30, *Calc. Iod.*, 3 x, *Iodine*, 3 x, *Kali Hydroid.*, 3 x, *Sulphur*, cc.

Calc. Carb., 30, for fair skinned, plump, waxy children; teeth delayed; swollen glands; discharges from eyes, ears, nose, etc.

Calc. Iodide, 3 x, same as *Calc. Carb.*, when the latter does not succeed.

Iodine, 3 x, glandular enlargements, with wasting of the muscular tissue. Child is very thin in flesh. Mesenteric glands enlarged.

Kali Hydroid., 1 x, little nodules under the skin; lymphatic system involved deeply; disease of the bones, etc.

Cod-liver oil is often useful in those cases that are especially emaciated, and who do not seem to assimilate food, yet plenty is taken; it should not be taken if fever is present.

Scurvy.—*Citric Acid*, 1 x, or lemon juice, the best remedies.

Kali Bich., 3 x, salivation with sore gums and hemorrhage under the skin.

Acid Sulphuric, dilute, five drops every three hours, for hemorrhage from mouth, stomach, or bowels. The diet should consist of fresh meat, vegetables, and milk.

Sea-Sickness.—*Cocculus*, 30, the great remedy for sea-sickness, either from vessel sailing, car or carriage riding.

Simple Inflammatory Fever.—Rarely requires anything more than *Acon.*, 3 x.

Slow or Nervous Fever.—*Bryonia*, 3 x, yellow coating on tongue; constipation; pain in the right side of the head; lips dry and cracked.

Nitric Acid, 3 x, torpid, sluggish liver; sallow complexion; acid or bitter taste in the mouth, when the fever has continued thirty or thirty-five days without recovery.

Hyoscyamus Nig., 1 x, for sleeplessness during nervous fever. Bathe the patient with a solution of *Bicarbonate of Soda* and hot water, once daily.

Snuffles, or Cold in the Head.—*Acon.*, 3 x, and *Bry.*, 3 x, are the remedies most generally useful. *Kali Iod.*, 3 x, also an admirable remedy.

Sore Mouth (Aphtha).—*Ars.*, 3 x, and *Merc.*, 3 x, are the remedies, internally. Use a wash of Golden Seal, fluid extract, one part to ten of water.

Sore Nipples.—Give *Silicea*, 30, internally, and apply *Calendula* ϕ, one part to ten of flexible *Collodion*, over the cracks or ulcers.

Spasm of the Glottis.—*Acon.*, 1 x, is all the remedy needed generally.

Squinting.—If from brain irritation, *Cimic.*, 3 x, and *Zinc*, 30, will benefit. From contracted muscle, a surgical operation.

Stiff Neck.—If caused from sitting in a draught, give *Acon.*, 1 x.

Rhus Tox., 3 x, from getting wet.

Lachnanthus, 3 x, stiff neck, following diphtheria. *Faradization* will promptly relieve.

Stitch in the Side.—*Acon.*, 1 x, effects of a cold; rheumatism of the muscles of the chest.

Bry., 3 x, dry cough, with stitches in the chest.

St. Vitus' Dance (Chorea).—The leading remedies are *Ignatia*, 30, *Cimicifuga*, 3 x, *Arsenicum*, 3 x, *Ferrum*, 1 x, *Cuprum*, 30, *Zinc*, 30. If the result of a fright, give *Ignatia*, 30: if from debility, *Ferrum*: if from rheumatism, *Cimicif.*, 3 x: if from brain and spinal lesions, *Cuprum*, 30, and *Zinc*, 30.

Galvanism should be used at the same time.

Styes (Hordeolum).—*Puls.*, 3 x, will generally stop them. A course of *Sulphur*, cc, will prevent a recurrence.

Suppression of Urine.—Apply hot applications over the region of the kidneys, and give *Acon.*, 1 x, and *Terebin.*, 3 x, alternately.

The hot pack will be useful also.

Teething.—*Calc. Carb.*, 30, will generally advance the teeth when they are delayed.

Kreasotum, 4 x, often relieves the sensitiveness of the gums and reflex nervous excitement.

Chamomilla, 30, child is very nervous and cries often; colic and diarrhœa.

Thrush (Aphthæ).—*Ars.*, 30, when it occurs during the course of a debilitating disease.

Merc. Cor., 3 x, occurs suddenly, without previous symptoms.

Hydrastis, 1 x, lingers and does not readily disappear; stomach out of order.

Toothache.—*Acon.*, 1 x, when from cold.

Bell., 1 x, with red, flushed face, and pressure of blood to the brain.

Merc., 3 x, tendency of the tooth root to ulcerate.

Typhoid Fever.—*Baptisia*, 1 x, alternating with *Gelseminum*, 1 x, will abort a Typhoid Fever, if given soon enough.

Bry., 3 x, violent headache; restless sleep; tongue coated yellow, with dry, parched lips; great thirst for large quantities of water. Should not be used after diarrhœa sets in.

Mercurius, 3 x. Tongue loaded with a thick, moist, creamy coating; painful sensibility of the whole abdomen; bloody stools; sweating without relief.

Rhus Tox., 3 x. Temperature high; tongue dry; dark coating on tongue and teeth; delirium; headache; nose bleed; debility and prostration; pulse weak and slow; abdomen bloated; frequent diarrhœa.

Arsenicum, 3 x, hot, dry skin; thirst; red tongue; yellow diarrhœa; great prostration; face pale and shrunken; falling of the lower jaw; bed sores; picking at the bed clothes; distended abdomen; will restore a patient, ofttimes, when considered beyond help.

Muriatic Acid, 1 x, extreme prostration; patient stupid and unconscious; sliding

down in bed; low, muttering delirium; inability to protrude the tongue; depression of the lower jaw; turning up of the eyes; involuntary stool and urine.

Hyoscyamus, 1 x, violent headache; delirium; wild, and tries to uncover himself and get out of bed.

Ulceration of the Bones.—*Silicea,* 3 x, suppuration following an injury, also *Calc. Phos.,* 3 x. When the ulceration is the result of syphilis, give *Kali Iod.,* 1 x, or *Nitric Acid.* Dead bone should be removed, and the diseased part washed out with a solution of *Calendula,* one part to eight of hot water. A surgeon should have the care of the case.

Ulcers of the Leg.—*Ars.,* 3 x, burning pain in the ulcer; low state of the blood.

Silicea, 30, deep, excavating ulceration; varicose veins. Use a wash of *Calendula,* one part to ten of water, and bandage with rubber. After they have healed, wear an elastic stocking.

Ulcerated Sore Throat.—*Acon.,* 1 x, or *Bell.,* 3 x, simple sore throat from cold.

Merc., 3 x, and *Kali Bich.,* 3 x, for inflammation of the follicles of the throat, commonly, but very improperly called "diphtheritic sore throat."

Varicose Veins.—*Hamamelis,* 1 x, internally, a good remedy. The extract may also be used externally.

Vomiting.—*Ipecac,* 1 x, nausea and vomiting; yellow coated tongue.

Arsenicum, 30, red tongue; everything is vomited as soon as taken; burning pain in stomach; thirst.

Antimony Tart., 6 x, vomiting, caused by irritation at the base of the brain.

Verat. Alb., vomiting, attending diarrhœa. Small pieces of ice held in the mouth or swallowed, will often arrest vomiting. A mustard paste over the stomach will help.

Warts.—*Thuja Oc.,* 3 x, internally, and ϕ, locally.

Wasting (Emaciation, Atrophy).—*Calc. Iod.,* 3 x, where the trouble is with the lymphatic system; scrofulous.

Calc. Phos., 3 x, children with large heads, where the bones have not properly closed.

Iodine, 3 x, one of the best remedies in Atrophy. Cod-liver oil, when without fever, the system does not seem to appropriate food taken.

Water Brash.—*Nux Vom.,* 3 x, will generally remove the troublesome symptom.

Watery Eyes.—After opening the lachrymal ducts, give *Silicea,* 30, twice daily.

Whites (Leucorrhœa).—This is only a symptom of some disease of the womb, and can only be cured by giving such remedies as will cure the primary trouble. *Ars.,* 3 x, will be useful if the discharge causes a burning in the vagina, is profuse and watery.

Merc., 3 x, the discharge makes the skin sore, is thick and yellow or greenish.

Kreasotum, 4 x, discharge offensive, of any consistency.

Nux Vom., 3 x, debility; menses too soon; constipation, etc.

Calc. Carb., 30, profuse menses; yellow, profuse leucorrhœa.

Sepia, 30, relaxed mucous membrane; sick and nervous headaches; delaying menses; chronic uterine troubles.

Sulphur, cc, useful where any of the other remedies seem to be indicated but do not help. *Calendula* solution by injection, also *Golden Seal.*

Whooping Cough.—*Bell.,* 3 x, flushed face, with violent spasm. *Ipecac,* 1 x, vomiting accompanying the cough.

Cuprum Acet., 30, violent whooping which is constant.

Corralium Rubrum, 30, will cure many cases as though by magic.

Verat. Vir., 1 x, may be useful if the chest becomes congested. Violent attacks of whooping cough can be controlled by *Kali Bromide, Bell.,* and *Castanea Vesica,* and they should be used under the special direction of the physician.

Worms.—*Cina,* 30, will remove symptoms occasioned by worms.

Artemisia Vulgaris, 1 x, convulsive and nervous irritation caused by worms.

Yellow Fever.—*Camphor* ϕ, violent chills, with prostration.

Acon., 1 x, fever, burning heat, with quick, wiry pulse; restlessness and great anxiety.

Bell., 3 x, congestion of the brain; throbbing of the blood vessels in the neck; red face; red eyes, which are sparkling; delirium; pain in the stomach, with nausea and vomiting.

Bryonia, 3 x, splitting headache; eyes red; tongue coated yellow; parched lips; great irritability and vomiting.

Argentum Nit., 4 x, dark colored vomiting, caused by hemorrhage from the mucous membranes of the stomach.

Arsenicum, 3 x, face yellowish and livid; eyes dull and sunken; lips and tongue brown or black; burning pain in the stomach; suppression of urine; short, anxious breathing; pulse small and tremulous; cold, clammy perspiration; great prostration and black vomiting.

Hyoscyamus, 1 x, *Veratrum Alb.,* 1 x, *Crotalus,* 30, *Cantharides,* 3 x, and *Ipecac,* 1 x, may also be called for.

The diet should consist of milk, beef-tea, etc., as in typhoid fever. Isolate the patient, and use disinfectants freely.

OSTEOPATHY.

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The beginning of Osteopathy is due to one man, Dr. A. T. Still, Kirksville, Mo. This man was a young physician living in Kansas during the formative period of that state. His was a great thirst for a knowledge of the human body. Many years of original research and investigation marked the steps of progress. Proof of the theories which he held was made on many sick people before he finally announced his discovery to the world in 1874.

Osteopathy is a method of treating abnormal conditions or disease by manipulations. It is the removal of structural malpositions and irritations, or the stimulating or the inhibiting of functional activities. No endeavor will be made to amplify this definition. Some known facts are fundamental to the science of Osteopathy. A few will be stated and explained. These interpretations will enable the reader to see the fitness of the definition.

How Deviations or Malpositions Cause Disease.—The second great basic principle of Osteopathy, and probably the most startling to the medical world, is that deviation or malposition of parts is the great cause of disease. Health is harmony in the body. Harmony cannot be maintained where there is abnormality of structure or malposition of part. Hence, health is present where there is a normal position and structure of parts.

The body is a vital machine—a machine imbued with life. The body, being its own laboratory, selects from the food the essentials for repair. The body is self-regulative in function. The vital processes are kept at work at a certain rate. This power of self-repair and self-regulation is often hindered or altered. This will cause disease, or lack of harmony. The abnormal position of some part will hinder or alter this power of repair and self-regulation of function.

The most common class of lesions which the osteopath finds, and the most far-reaching in their effects, are the ones occurring along the spine. A short study of the spine will explain the importance of such deviations. There are twenty-four small bones, vertebræ, in the spinal column from the head to the sacrum. The sacrum is the wedge between the innominate or hip bones. The vertebræ are placed one above the other. They are held together by ligaments and muscles. There is a small hole through the center of this column of bones. This contains the spinal cord and the origin of the thirty-one pairs of spinal nerves. Between each two of these bones are little openings called foramina.

Through these openings the nerves find their way out of the spinal canal, and the blood vessels enter in to nourish the structures. The osteopath often finds some of these vertebræ twisted or wrenched from their normal position. Some deny the truth of this statement. No one doubts that the elbow may be dislocated, or that some bone in the wrist may be wrenched from its normal position. The bones along the spine have articulations the same as other joints. They have small, plane surfaces for one bone to work, or move, on the other. A vertebra may be moved too suddenly, too forcibly, or too far. Its normal position is changed. This is a slip, a subluxation, or partial dislocation. A complete dislocation is impossible in most parts of the spine without a fracture; but that a slip may and does occur is attested by many cases. A person attempts to lift a load too heavy for the spinal muscles. A wrench, followed by pain and inability to move, is experienced. The person eventually gets rid of the pain and moves with comparative ease, yet he is not able to lift the load previously lifted. The abnormal position of some vertebra is the cause. Correct the abnormality of position and he soon has his former strength.

Why are such lesions or abnormalities of greater significance than others? (1) The irritation or pressure to a greater number of nerve fibers. The size of these openings is decreased because of tension on the ligaments and muscles, which tension is caused by the spinal deviation. Nerves passing through are thus irritated or pressed upon. The tension of muscles and ligament increases the condition. (2) Pressure and tension on blood vessels. This lessens the amount of blood carried to the spinal cord, and a starving of the nerve centers takes place. A congestion of the spinal cord may follow if the veins cannot carry the blood away. (3) The great distribution and connections of the nerves. An injury to the second dorsal or back vertebra may cause trouble in the eye, the lungs, the bronchial tubes, or the heart, as well as contracture of the muscles of the back. The how and why of this is readily seen. The nerves which come from the spinal canal in this region send fibers to the muscles of the back, to the eye, to the bronchial tubes and lungs, and fibers to the heart. Thus a number of organs may be affected by one misplacement or slip.

The starving of the spinal cord referred to weakens the vitality of the nervous system. All parts of the body controlled and supplied by these weakened nerves are likewise weakened. Such a condition demands the attention of the physician. The cure of such weakness depends upon the removal of the spinal condition.

Other Lesions than Bony Ones.—Bony lesions are not the only

ones found. Irritation of nerve and muscular contraction are almost as common. Tenderness is always an accompaniment of such cases. The nerve irritation and muscular contracture may be due to a chilling wind, especially if the body has been previously overheated. Overwork and sprains are also causes.

Such irritation and contractures may be a secondary condition. Instance, the eating of food or drinking something that irritates and congests the kidneys. The nerves to the kidneys are excited, and the impulses started are carried to the center in the spinal cord at the tenth, eleventh, and twelfth dorsal, just above the small of the back. Each of the three divisions of the spinal nerves receives some of this stimulus or irritation from the kidneys. Contracture, rigidity, and tenderness are found along the back in the region mentioned, because of this irritation.

Eating of food that is irritating, or taking too much food, may act in like manner on the nerves in the coats of the stomach. Like results are found, except that the location is higher up on the back and corresponds to the origin of nerves to that organ. These are nearly in the middle of the back.

In this short study, sufficient has been said to show that the body is a vital machine, self-repairing and self-regulative in function. The structure of the part determines the function. Proof was given to show that the self-regulative power of the body could be altered or hindered. The great cause, distinctly osteopathic, which altered or hindered the body power, was some bony lesion. Other factors, such as nerve irritation and muscular contracture, may act as causes. Any and all causes demand removal in order that harmony may be restored and health follow.

Practical Therapeutics of Osteopathy.—In taking up the practical side, the treatment of the disease is the issue. Two questions on treatment naturally present themselves: (1) How does the osteopath discover the conditions present, and does this differ from a medical examination? (2) How are conditions removed when found?

A Proper Examination.—In order to discover the condition of the body, an examination is necessary. To make a correct examination, it is best to remove all tight clothing from the trunk of the body and to fully expose the back. A position, sitting on a stool with the head bent slightly forward, hands resting on the knees, is really the best. By sight and by touch the work must proceed. The condition of the normal curves of the spine is noted.

A definite examination of each vertebra in the back is made by com-

paring the position of the posterior and lateral processes of each—the one with the other. The general flexibility of the back is found by moving the patient in different directions—forward, backward, to one side, and then to the other, followed by a rotating and turning movement. The ease of movement determines the amount of flexibility. Difficulty of movement or lessened range shows rigidity. The contracture of the muscles is detected by a ropy, band-like feeling on passing the fingers over them. Such areas of contracture show that the muscles to this part of the back have been irritated directly or reflexly through the nerves. The source of the irritation must be located. By such an examination, wrong position of the bones of the spinal column is found if present.

Each rib must be examined. A slip or twist of a rib may cause great pain or annoyance. A blood vessel and a nerve run along the lower border of each rib. There is a set of muscles on each side of the nerve and the blood vessels. These muscles may contract, irritate the nerve, and cause pain. The rib may slip or twist at its junction with the backbone—another cause of pain and tenderness. Such pains sometimes simulate heart trouble and worry the individual greatly. Remove the above condition, the patient is freed from pain and soon reports the disappearance of the so-called heart disease.

To complete the examination, the patient is placed on a table on the back. The position of each bone in the neck and the condition of the muscles of that region are closely examined.

Such an examination is essentially osteopathic and is made only in special cases by practitioners of other systems.

The attention is directed to the internal organs and, if necessary, the exact condition of any organ, as lungs, stomach, etc., is supplemented by any further investigation needed.

Thus it is that a diagnosis of the case is made. The prognosis depends on the kind of wrong position present and the possibility of its removal. The effects on blood vessels and nerves must be taken into consideration in making this prognosis.

How to Remove Conditions Found.—There are generally two parts to the treatment of all cases. First, general manipulative measures; second, corrective measures.

In giving treatments, the machine used by the osteopath is the hand. The way is manipulation, and he takes advantage of the many levers in the body. You will hear some say he rubs, which he should never do; others that he presses, another that he pulls and twists. He may do all of these and more. While this is true, no one must get the idea that the

osteopath does not believe in proper sanitary measures or proper eating and drinking. He insists on proper cleanliness of body and surroundings of patient, and may admonish the patient concerning his diet.

General Manipulative Measures.—In order to understand some of the general manipulative movements made, the reader must know that the blood supply and the nerve force of the body can be controlled or regulated.

The Nerves of the Body.—How is this great Executive Department managed? (1) An effect can be produced by steady pressure on a nerve; this is called inhibition. Instance, sitting with a leg or arm over the edge of a chair or with the legs crossed. In a short time the individual attempts to move the limb; there is no feeling in the part, the power to move it is almost if not entirely gone. He feels as if a stick of wood were fastened to him. What has happened? The impulses along the nerve have been lessened by the steady pressure; and in the case cited they were entirely stopped. Thus steady pressure on a nerve lessens its activity or completely stops its action. When these impulses begin to return, the fact is made known to the individual by prickling sensations as if a thousand needles were dancing through the part.

(2) Another effect on nerves may be produced by vibration or by alternate pressure and removal of same. This is called stimulation. The doubting Thomas has but to hit his "crazy bone" (ulnar nerve) at the bend of the elbow; a strong stimulation follows. There may be actual movement of the parts below as shown by twitching and convulsive motions. The pain seems severe enough to satisfy almost anyone that a great stimulation was produced. The effect of such treatment is to start nerves to action or to increase present activity.

It is readily seen that all nerves within reach of the fingers may be controlled. What of those not directly accessible to the fingers? They, too, may be regulated. How is this done?

All nerves are connected with some center. In our study of the anatomy of the body it was found that these centers have connection with the skin surface by one of their branches. The stimulation or inhibition of the skin branches will affect the center. From the center these impulses pass out over the many fibers leaving it. Therefore any effect on the center affects the nerves connected with that center. These effects are to those nerves not accessible to the touch as well as those that are. Nerves are injuriously affected in a very marked way by contractured muscles. It devolves upon the osteopathic physician to remove the sources of this irritation, the contracture. It has been clearly stated how

these contractures are detected. The removal of such conditions may be accomplished in two ways: (1) Steady pressure on the muscle; the muscle relaxes and ceases to be a source of irritation. (2) Increase the distance between the attachments of the muscle. This is a stretching process and relaxation follows.

The Blood Supply.—The action of the muscles assists in the movements of this great Transportation System, the blood stream. It has just been shown how contractures of muscles are sources of irritation. The method of removing such conditions was also explained. Normal muscular action will follow. This will give the proper assistance to the movement of the blood.

The Executive Department, the nerves, controls the Transportation Department, the blood stream. The methods used to control the nervous system have been explained; thus the regulation of the blood stream is made doubly sure.

There are instances where neither the blood stream nor the nerve impulses can be regulated by the above treatments. In such cases the difficulty is found to consist of bony malposition or displacement. A reference will be made to this under the head of corrective measures.

Specific Manipulation.—The explanation of methods of work on muscle, nerve, and other tissue just given is of a very general nature. Such treatment is not specific. Specific work consists in the use of any one or more of the measures mentioned, in some specific area of the body, to produce a specific effect. Instance, the inactivity of the liver and a consequent constipation. The nerves to the liver are from the middle of the back. Any condition detrimental to nerve and blood activity, as contractured muscle, slipped vertebræ, or drawn ligaments, must receive special attention. The muscle contracture is reduced by steady pressure, or by stretching the muscle. The ligaments are stretched by flexion and rotation. The liver is directly stimulated over the abdomen, just under the edge of the ribs on the right side. The bony luxation will be treated as given below.

Corrective Treatment.—In some ways the specific treatment, as given, may include or mean corrective treatment. The use of the term "corrective" should be limited to the removal of bony lesions, such as a slip of a vertebra, twist of a rib, or dislocation of larger joints. With this understanding of the word, an explanation of the method of procedure will be given. Instance, a young man falls on his head while exercising on a turning bar. The force of the fall twists the third bone in the neck to the right and slightly backward. The head is thrown to

the left, the chin to the right, and held rigid in this position. The examination is made the second day after the fall. The first step toward the correction of this lesion is to relax the muscles of the neck as thoroughly as possible. It may take several treatments to accomplish this result by the methods given above. The bony lesion is then reduced as follows: Exaggerate the condition by bending the head further to the left. Follow this bending with a straightening of the head, a twisting or turning motion being given to the neck at the same time. The length of time and the number of treatments required to reduce the difficulty depends on the severity of the lesion. Other movements may be used to accomplish the same result. The mechanism of the neck is such that one practitioner may find some movement of greater value to him than that used by another.

The reader must not infer from the preceding that Osteopathy is a system of treatment used only for misplacements and nervous troubles. Such conditions, it is true, are readily amenable to osteopathic treatments in a large proportion of cases. Many other conditions are equally so.

Two classes of diseases are worthy of such attention: (1) Diseases of women. (2) Fevers.

Diseases of Women.—Diseases peculiar to women constitute, as a rule, some disturbance of function or structural change in the organs of the pelvis. There are two sets of nerves to all these viscera: the cerebro-spinal and the sympathetic. Both sets are easily reached by osteopathic manipulations. Inhibition or stimulation can readily be given to either set. Muscular contractures are as easily removed here as in other parts of the body. Direct examination of the parts can be readily made. Wrong position and structural changes are easily detected. Replacement is made if necessary, then such manipulation given as will strengthen the ligaments of misplaced organs. The parts will then be retained in their normal position. Circulation to the parts here is controlled in the same manner as that of other parts of the body. Catarrh of the parts does not continue after the establishment of a normal circulation. The control of all abnormal discharges is closely allied with the control of the circulation of the part, the seat of the discharge. Much of the nerve irritation in this region is due to slips, twists, or wrenches to some of the bones of the pelvis. By giving such moves as are necessary to overcome these malpositions, nerve irritation and pain are stopped. This corrective treatment is absolutely necessary to the proper management of diseases of women.

Fevers.—The second class to which the attention is called is fevers. There is a rise of temperature accompanied by an increase in the pulse rate. There is also rapid wasting of tissue, burning up as it were. A sluggish or almost suppressed action of the excretory organs (bowels, kidneys, and skin) often accompanies such diseases.

How are such difficulties overcome? The origin of the nerves to the kidneys, as stated, is just above the small of the back. Those to the skin are from the neck region to the small of the back. Those to the large bowel are from the region of the small of the back. The normal action of the liver is necessary to regulate bowel movements. The origin of nerves to this viscus is in the region of the eighth, ninth, and tenth ribs. This knowledge of the condition of the body and the origin of the nerves controlling the different viscera and their functions gives the clue to the treatment. Stimulation, inhibition, removing muscular contracture, or corrective measures for malpositions, any or all are used. Such intelligent work on these different centers is always attended with beneficial results if the case is a curable one.

There is quite a rise in the heat of the body in all fevers. Centers governing the production of heat and the loss of heat are found in the brain. The sympathetic nerves in the region of the neck are closely connected with these centers in the brain. These nerves in the neck and between the shoulder blades are also closely connected with the center in the brain that controls the increase and decrease of size in the blood vessels. The treatment in these two areas is of the utmost importance in all cases of fever. Through these nerves, and the control of the blood supply of the brain, the activity of these centers is regulated. The blood vessels to the skin surfaces dilate, more blood passes to these parts, and the heat is thrown off, lessening the fever. The severity of the case determines the number as well as the frequency of the treatments.

Space does not permit a full explanation of the methods and effects of osteopathic treatment in the above conditions, and forbids the discussion of many others. Yet it can be safely affirmed that all forms of curable diseases and disorders are amenable to osteopathic treatment. A word more will be given in support of the above statement: (1) The blood is regulated by such manipulative measures. (2) The nerves of the body are susceptible to mechanical treatment and can be regulated thereby. (3) The nerves control all bodily activities, including nutrition and elimination. Hence the proper control of these forces conduces to harmony in the system, Nature asserts herself, and a cure follows.

RADIOTHERAPY.

X-Rays in Medicine and Surgery.—An entire volume would not suffice to mention by title alone the books and articles that have been written in attempts to tell what X-rays are and how their effects are produced. The fact that scientists and medical practitioners who make daily use of them in experiments and practice do not understand their nature fully does not prevent them from taking advantage of the great power and benefit that they place at their disposal. Nothing is known of the true nature of electricity, yet mankind does not hesitate to employ it as a beneficent agency in daily life.

The plainest statement that can be made about the nature of X-rays is that they are a form of electric light rays. They are produced when a strong induced electric current passes through a Crookes tube, which is a glass tube or bulb from which the air has been exhausted as far as possible, and into which wires lead at each end, along which the electric current passes. The X-rays can penetrate many substances through or into which ordinary light cannot pass. They, however, affect a photographic plate in the same way as sunlight, so that it is possible to take photographs of the bones and parts of the body hidden by the flesh. They do not pass so easily through bone and some other substances as they do through clothing and flesh, consequently, the photographs, or skiagraphs as they are called, appear like shadow pictures with the flesh as the higher lights and the bones and denser substances as the dark shadows.

Risk to Patients in X-Ray Examinations.—In the early days of experiment and work with imperfect apparatus in the hands of unskilled and inexperienced operators, a few cases of what are known as X-ray burns occurred. Reports of these cases were enormously exaggerated in a sensational way to which the novelty and the mystery of the force added not a little. It is true that if a patient be exposed to the effects of the rays for too long a time, or if the current is too high, or if the patient is placed too close to the tube, an "X-ray burn" will result. These burns are simple surface inflammation of the skin; deeper burns involving the tissues under the skin; or after-effects in the form of ulceration and slow healing. There are a few considerations which will satisfy anyone that there is in the hands of an expert and skilled user of the apparatus absolutely no danger of any of these conditions resulting.

1. In the first two years, when the apparatus was of the crudest and there was no such person as an expert operator known, when every one

with a smattering of sciences and with the poorest means at hand was making exposures under circumstances that would cause a skilled operator to-day to shudder, with over twenty millions of exposures made all over the world, not more than one hundred cases of burns were known. Operators at this time were experimenting to get these very counter-irritant effects.

2. The operator himself is more exposed to the action of the rays than the patient is. Especially is this true when he operates on several cases a day, while the patients have but one exposure each.

3. This action is purposely brought about by long exposure in order to effect many of the cures of skin diseases, cancer, etc.

4. With high vacuum tubes, at a distance of not less than twelve inches between the tube and the nearest tissues, and an exposure of not more than fifteen minutes, a case of burning of even the slightest degree is an impossibility.

5. When the patient is poorly nourished and the surface is heavily coated with hair, there is greater possibility of burning in exposures that exceed ten minutes.

6. Long exposures are not to be repeated at intervals of less than a week.

7. Low tubes, those in which the vacuum is not high, and heavy currents increase the possibility of injury.

8. During the Spanish War there were constantly employed seventeen machines for the examination of the wounded in the field stations and on board ship. There were only two cases of burns reported during the entire war.

To show the extent of popular prejudice against the use of the rays for examination, the following is quoted from the experience of Dr. S. H. Monell, the eminent Roentgen ray expert:-

"An intelligent young lady of fifteen with a dislocated shoulder exhibited the greatest terror when asked to stand a moment in front of the tube for a fluoroscopic examination which would have produced no sensation whatever. She declared she knew it would burn her up, and would hurt awfully. When the nurse took the position and assured her that she felt nothing, the girl allowed a brief examination, but was so nervous and alarmed that she was almost in hysterics. It should be the duty of every physician, whether he uses X-rays himself or not, to instruct his patients for their protection against dread and distrust of them."

The Fluoroscope.—The taking of photographs, or skiagraphs, for purposes of examination causes the delay necessary for the development of plates and the printing of the pictures. This is not altogether avoid-

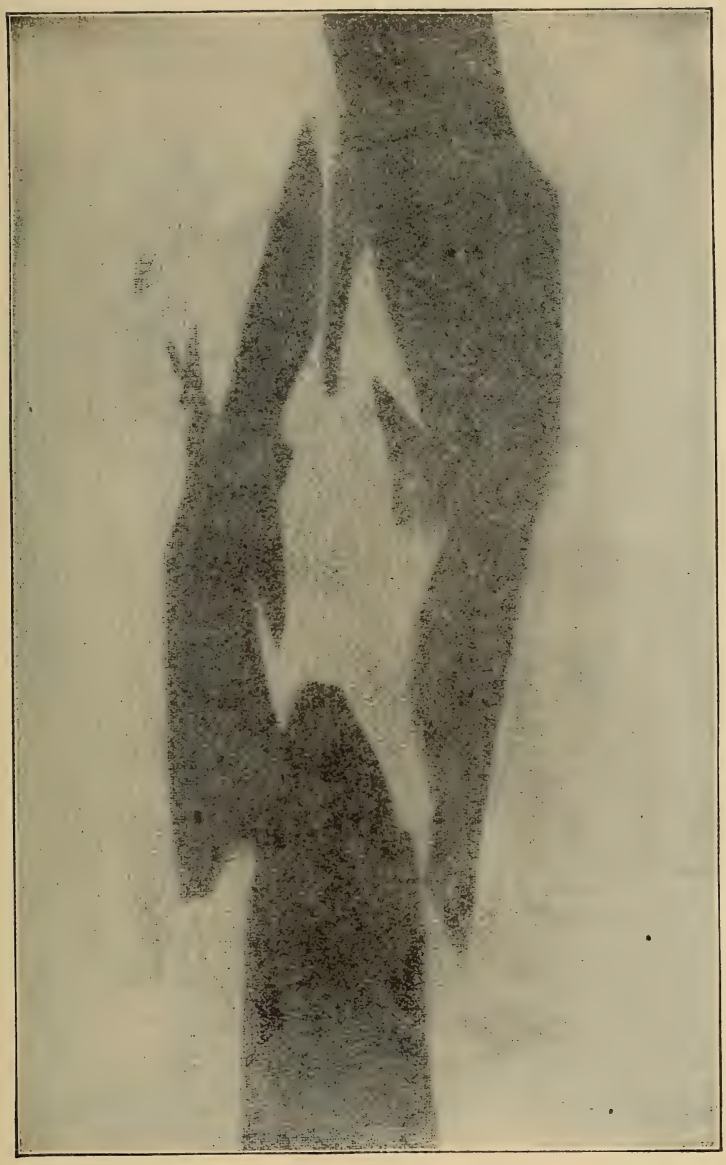
able, for there are many cases where the photograph must be taken in order to make a correct and leisurely diagnosis of the case. But by means of the fluoroscope it is possible for the examiner to see directly the part or organ that is under examination and to extend this examination over large areas. This advantage is well exemplified in the case of a child that had swallowed a safety pin. Five days after, it was examined by means of the X-rays and the fluoroscope. After unsuccessful examination of the œsophagus and the stomach, the pin was found in the intestines. It was open, but it was pointing in the right direction. The physician refused to operate, on the ground that as it had gone so far in safety it would go the rest of the way. It was passed the next day.

In another case, a boy five years old was suffering from hemorrhages, pain in the stomach after eating; was in a highly nervous and emaciated condition. Seventeen months previously he had swallowed the key of a bookcase. No pain had been felt for twelve months after. The fluoroscope showed the key. The boy was given an anæsthetic and the forceps introduced into the œsophagus. The fluoroscope showed that the forceps were two inches too short to reach the key. By changing the boy's position and pressing on the abdomen, the key was reached and extracted. It was three inches long, and corroded so much that the handle was no thicker than a sheet of paper. Sharp, ragged edges were forming through the corrosion. The child would certainly have died from starvation, hemorrhage, or inflammation.

Thus one great value of the fluoroscope, in addition to its value in locating a foreign body, is the power of guiding the instruments aright without the necessity of making openings into cavities. It also enables an operator to proceed at once with an operation, which is often an important consideration.

Foreign Bodies in the Œsophagus.—Another interesting case is that of little Beatrice Ward, of London, England. While playing with a little toy bicycle, she accidentally swallowed it. Physicians worked in the old-time way for four days to remove it. Then she was taken to the hospital in a weak and emaciated condition owing to her inability to take food. A skiagraph was at once taken and the toy was plainly visible in the œsophagus. An operation was at once performed. In order not to disfigure the child, a very small opening was made in the throat, an instrument was inserted and the bicycle cut in two. In this way it was easily removed. The child was unable to swallow and was fed by a tube passed into the mouth. At the end of a month she was discharged in good health.

SKIAGRAM SHOWING THE SPLINTERING OF ONE OF THE BONES OF THE FOREARM BY A BULLET. COMPLETE AND RAPID RECOVERY.



X-Ray Photograph or Skiagraph of Shattered Femur or Long Bone of the Leg. The Patient recovered fully in Two Months, the Progress of the Knitting being closely watched through the Splints and Bandages by the aid of the Fluoroscope.

Coins are often swallowed by children and, by reason of their lodging in the throat sidewise or face upward, it is hard to locate them. By causing the child to swallow as far down as possible a little solid food, the point at which it stops is easily located by the fluoroscope or by means of a skiagraph.

Foreign Bodies in the Eyeball.—Mechanics and other metal workers often suffer from the lodgment of pieces of sharp metal in the eyeball. The great value of the X-rays is not only in locating them, but the shortest road to them is pointed out so that there is the least possible injury resulting from the operation.

Examination of the Brain.—Tumors and abscesses of the brain are always extremely difficult to diagnose, and their location by ordinary means is almost an impossibility, at least with certainty. These are coming more and more in the reach of the expert by reason of great improvements in apparatus and the greater experience in reading skiagraphs.

Bullet wounds in the head have always presented great difficulty on account of the difficulty of probing for the ball. The location of such is now an easy matter, and the possibility of relief from an operation is clearly determined.

X-Rays in Dentistry.—The profession was very quick to realize the great assistance that it would derive from the use of skiagraphy in their work. Among its uses may be mentioned the certain knowledge about teeth which have not yet erupted. Where the full complement of teeth have not appeared at an age when they are all to be in place, a dentist can tell at once whether there is a tooth in the alveolus or not. Hence he will be able to decide accurately upon the advisability or necessity of supplying one. In extraction of the molars when impacted, it is of the greatest assistance to know in what direction the roots of the tooth run. Ignorance on this point is the cause of the breaking of teeth in extracting. The presence and extent of an abscess are clearly demonstrated by a skiagraph and by it alone. Abnormal formation of the roots of teeth is at once made clear. The presence of a portion of an instrument accidentally broken in the canal and whether or not the extremity of it projects beyond the apex, a fact of the utmost importance, are made equally certain. The dentist is able to examine the root of a badly formed tooth and to at once decide upon the possibility of attaching a crown to it; he thus knows beforehand the prospects of success attending the operation. He can locate broken roots in the sockets and tell their size, position, and shape, as well as decide upon the best means of removing them. In cases of injury to the teeth and mouth from blows, he can tell whether

the root of a tooth or the process is injured or broken. These are a few of the uses to which the X-rays are now put in dental surgery.

Detection of Incipient Consumption.—This calls for keenness of perception that only long practice can give. The power to distinguish between the shadows cast by flesh and those of bone is an easy matter; but when it is necessary to tell what shadows are cast by water, as in pleurisy, or of pus, as in emphysema, or by blood is all a matter of eye-training secured by wide experience. The early deposits of the tubercle in the lungs are hard to detect. When the lungs are healthy, they are translucent so far as the X-rays are concerned; the matter deposited by the tubercle casts a very faint shadow at first, not appreciable by any but a skilled operator. Where a great number of cases pass through an expert's hands and a record of the cases is kept, he in time comes to perceive the changes which the subsequent history of the case confirms or contradicts. It is unnecessary to go into the technic of the manner of detection, but it is sufficient to say that the X-rays can detect consumption earlier than the stethoscope can, and can also record the ravages of the disease and note any improvement in the case.

Detection of Aneurism.—It is a matter of record that the X-rays can demonstrate the existence of aneurism before there are any physical signs of the disease. In other affections of the heart, it is possible to observe the heart's action and to observe the irregularities of a diseased condition.

Detection of Stone in the Kidney, Renal Calculi.—Not only is the detection possible, but accurate location can be made with the greatest nicety. Very recently, stones were recognized and located in a case, and immediate operation was decided upon. Incision was made and the affected kidney was drawn through the opening. The stones were cut down on and removed. The patient made a good recovery.

Stone in the Bladder.—The detection of stone in the bladder by ordinary means is usually quite easy; but there are cases when the method is painful, and, in a few, such as those in which mechanical difficulties exist, the ordinary means are impossible. In all cases, the X-ray method is not only satisfactory in point of time, ease, and comfort to the patient, but in certainty even in encysted and multiple calculus.

Examination of Fractures.—In no part of medicine or surgery are the results of an X-ray examination so satisfactory as in the examination of fractures. Of all the tissues of the body, bone offers the greatest resistance to the action of the rays and, consequently, casts the greatest and most distinctly marked shadow and contrast. To the untrained

eye a skiagraph of a fractured bone is clean and very easily read. One of the ordinary means of diagnosing a fracture is by rubbing the broken surfaces of the bone together and thus producing a sound known as crepitation, which is perceived by the combined senses of touch and hearing. When there is much swelling of the part, or when the bone is in an obscure part of the body, this is very hard to detect. When the bone is cracked or splintered, diagnosis by this means is often impossible. It is often extremely difficult to distinguish between a sprain, a fracture, and a dislocation. An examination by ordinary means is often attended with great suffering on the part of the patient. But with an X-ray examination, either by the fluoroscope or the skiagraph, all of this is changed. The bone and its condition is revealed to the surgeon's eye as clearly and distinctly as if it were laid open before him. Not only that, but he is able to tell when the parts are properly adjusted, and when the fracture or dislocation is properly reduced. Then as the bandages, splints, and casts offer no resistance to the penetration of the rays, he is able to examine the part every week, if necessary, and to watch the union of the bony parts, so that deformity from imperfect setting is impossible. If the bones are not properly adjusted, or if union between the ends of the bone does not take place in the right way, a deformity exists, and it is necessary to break the limb again and correct the deformity. This is impossible when X-ray examination is used. So great has been the revelation of slight fractures in cases of supposed sprains, that there is now no doubt that in the past, without the service of the X-rays, a great many small fractures have been overlooked.

Location of Foreign Bodies.—X-ray examination has proved invaluable in location of bullets, needles, pins, and pieces of glass, which, after entrance into parts of the body, travel considerable distances, not only in their first flight, but are moved onward in all directions by the working of the muscles.

The danger of infection from using a probe in the search for a bullet is very great. As it is pushed along the track of the ball, it carries into the wound much of the poisonous, infectious matter which has lodged in the wound, so that, no matter what antiseptic means are adopted, there is always danger of blood poisoning. In the majority of cases, the probe fails, so that the method of examination ordinarily adopted cannot be said to be successful. X-ray examination has proved to be of wonderful assistance in the Spanish War and in the war in South Africa. It is the opinion of military surgeons that the day of the probe and the electric probe has gone by. The bullet is easily and accurately located

and the surgeon cuts down upon it by the shortest path, leaving the path of the bullet to heal up without further laceration or with danger from infection.

The distances that needles travel through the tissues of the body, often without causing much pain until they reach certain points in the body, is really wonderful. So much is this the case that the point of entrance of a needle into the flesh is often of little value to the surgeon in locating it after a time. The X-rays locate them quickly and accurately, so that their removal is a comparatively easy matter. In fact, in all surgical cases of the sort, exploration with all its painful and unsatisfactory results is done away with.

Measurement and Examination of the Pelvis.—The measurement of the pelvis and examination for deformity are of the greatest value in cases of prospective childbirth. It is not in the slightest degree accompanied by any injurious results to either mother or child.

Curvature of the Spine.—As the spinal column is of great length, it is not possible to record upon a skiagraph a very comprehensive section of the vertebra on one exposure. It takes, perhaps, four or five to display the entire column. But the clearness with which even slight irregularities of form are recorded is of the greatest assistance in the treatment of this form of disease. It is valuable in indicating the progress of the disease under treatment.

Orthopædic Surgery.—The exact condition of the joints in all cases of deformity and enlargement resulting from gout, rheumatism, tuberculosis, or whatever cause, is distinctly shown by the X-rays.

ANTITOXIN IN DIPHTHERIA AND THE USE OF OTHER SERUM.

Antitoxin is a substance which counteracts the poison of disease. It is derived from the serum of the blood of an animal which has been inoculated by the poison of that disease, and in this way rendered immune against it. The antitoxin of diphtheria is derived usually from the body of a horse which has been inoculated or vaccinated with the poison of diphtheria for a period of three months. It is transparent and of a yellowish or reddish color. It is important that antitoxin be always of the same strength. This is secured by a process known as standardizing the solution. One unit of stardardized antitoxin is a sufficient quantity to neutralize one hundred times that quantity of the poison of diphtheria, which is just fatal to a guinea pig of two hundred fifty grams weight. The dose of diphtheria antitoxin standardized in this way is fifteen cubic centi-

meters. This is injected into the body of the patient under the skin when the disease is suspected or before the diagnosis is absolute. At the end of twelve hours, another dose of ten cubic centimeters is injected in the same way. This is the treatment adopted in the case of children. Adults require larger doses. If the case is very serious, the dose is increased. Twenty-five cubic centimeters are often given as the first dose and twenty-five more during the first twenty-four hours; it is not at all unusual for a dose of one hundred cubic centimeters to be given during the first few days. The portion of the abdomen where the injection is made is first washed with a four per cent solution of carbonic acid or a one per cent solution of lysol. It is customary in families where a case of diphtheria is suspected to administer small doses to the other members of the family, in order to render them immume against the disease. The injections are almost painless. Immediately after the administration, a swelling occurs under the skin, but it soon disappears with the absorption of the fluid. Antiseptic methods are adopted in the cleansing of the syringe, both before and after the dose is administered. No immediate results are observable from the antitoxin. Within twenty-four hours, however, the temperature of the patient will be observed to rise only one to two degrees. The pulse of a child may be from one hundred twenty to one hundred thirty beats per minute. This reaction is likely to be more noticeable in the case of children to whom the dose is given as a preventive than will be the case of those suffering from the disease. If the case is a very mild one, a favorable effect may be noticed within twelve hours; in very serious cases, it may be thirty-six hours before an improvement is noticed. The essential point of the administration of antitoxin is that it be given in time, and it is not wise to wait until a diagnosis is confirmed or until the disease is fully developed. In all cases where diphtheria is suspected, it is most prudent to resort at once to the preventive measures. The first favorable appearance after the injection of antitoxin is the change in color of the false membrane which forms in the throat; the change is usually from gray to white. Very soon after this change in color, the membranes become detached or expelled and usually do not reappear. Caution must be used about the time the membranes fall, for they may sink back into the throat and obstruct the breathing.

The change in respiration will be an indication of this, and in some cases tracheotomy may be necessary to prevent suffocation. Statistics from hospitals show that the death rate of diphtheria has been decreased from fifty and sixty per cent to twelve per cent by the use of antitoxin

It must be remembered that serum must be given early in the disease to secure the best results. After the third day of illness, the value of serum diminishes very rapidly, for the poison of the disease has made such headway that is is impossible then for the serum to neutralize it.

After the administration of serum, a redness or rash may be observed over the skin of the body; but this occurs in only very few cases, and lasts for only a short time. In a very few cases, sudden death has followed the injection of serum; in those cases it is not at all clear that it was the serum that caused death. On the other hand, there is abundant testimony to prove that the serum itself is absolutely harmless.

Antitoxin in Tetanus or Lockjaw.—The value of this serum has been abundantly demonstrated, not only by experiments upon animals, but in quite a large number of cases of lockjaw in adults produced by wounds. The great difficulty with which one has to contend in these cases is the rapid absorption of lockjaw poisoning into the system.

VACCINATION.

The reaction which follows inoculation with the virus of cowpox is known as vaccinia. This furnishes protection and almost certain immunity from smallpox. When, however, smallpox is taken by one who has been vaccinated, the disease is extremely mild and is known as varioloid.

All authorities agree that vaccination should be performed in infancy, and again at puberty. When smallpox is prevalent, it is a safe rule to vaccinate all who have not been successfully vaccinated within five years.

Mode of Vaccination.—The area chosen is to be thoroughly cleansed with soap and water, and, finally, with alcohol. The instrument used to scratch or scarify the skin should be thoroughly sterilized by dipping it in boiling water, or other antiseptic fluid. The scratched surface of the skin should not bleed, but merely allow a pinkish serum to ooze out. The virus is then applied. The quality and purity of the virus should be unquestionable. Protection is necessary while the wound is progressing, to prevent the clothing from touching it. The best protection for infants is afforded by a sterilized bandage sewed to the inner clothing. Older children may have a pad of sterilized gauze, held in place over the wound by strips of adhesive plaster. If there is a discharge of matter, the wound is to be kept clean and dried by means of a daily dusting with powdered boric acid. Poultices and similar applications are dangerous. After vaccination, the limb should not be washed for twenty-four hours.

Successful vaccination is followed by a pimple on the third day; a vesicle forms on the sixth, and a pustule, with a reddish rim, on the eighth. A crust forms over the pustule on the fourteenth day and falls off on the twenty-third.

It is not unusual for vaccination to be followed by eruptions and rashes of greater or less severity. Care in the selection and administration of the virus will greatly reduce them. The number of deaths resulting from vaccination is so small that they may be disregarded. In fact, all such are preventable by care. German records, faithfully kept, show only thirty-five deaths out of 2,275,000 cases.

HYDROTHERAPY.

There is a fine distinction made between Hydrotherapy and Hydropathy. The former is taken to mean the use of water in the treatment of disease as an aid or an adjunct to other medical treatment; hydropathy is to be regarded as a sole means of treating disease.

Whatever point of view may be entertained, there is no doubt of the very great value of water in the treatment of disease. Every one appreciates the value of hot and cold baths, of douches, of the hot and cold pack, administered by wrapping wet sheets around the body, and of the copious use of water internally.

These have been fully dealt with in the sections on "Personal Hygiene" and "Nursing."

In the animal economy, water plays an important part. In our food we consume large quantities of water, as it forms from eighty per cent to ninety per cent of a meal. Its great necessity is to aid in the elimination of poisonous and waste matter from the system. In this way, water not only accelerates waste, but aids in the construction of the same portion of the body. So we are obliged to recognize water as an important alterative.

In the form of a hot bath, water is an excellent stimulant, and frequently it increases the circulation from seventy to one hundred pulse beats or over, within fifteen minutes.

Of the emetics, warm water is to be considered one of the best. Its efficiency is much increased by the addition of a small quantity of mustard.

As a sedative, cold water in the form of a bath will lower the temperature, rapidly diminish the pulse, and reduce excessively high vital processes. This has been described fully in the article on "Nursing," where details of Brand's baths and their usefulness in typhoid fever are given.

As an anodyne, water in the form of hot or cold applications is extremely useful and the effects are quite familiar. In the form of ice or freezing applications, water is a useful local anæsthetic. By the alternation of hot and cold applications, chronic swellings of the joints and enlargements of glands are successfully treated and reduced.

It is probably in the direction of medicated waters, either natural or artificial, that the value of water as a curative agent is best known.

Alkaline waters owe their value to the fact that they contain the carbonate and bicarbonate of soda; other salts are present also in small quantities. The alkaline taste is disagreeable to many persons, but this is overcome by charging the waters with carbonic acid gas, which, while it does not affect their curative values, very greatly improves their taste. They are especially valuable, and produce their best effects, in chronic catarrh of the several parts of the body; nephritis, or inflammation of the kidneys; diabetes; acute and chronic inflammation of the bladder; gout; and chronic rheumatism. These are among the most common diseases to which man is subject.

Carbonic acid waters are recognizable by their bright, sparkling appearance, and are most valuable in cases of fever, in the relief of nausea, and the prevention of vomiting. Given in milk in cases of irritable stomach, they not only exert in themselves a beneficial effect, but also improve the taste of the milk.

Iron waters contain iron salts and are known as chalybeate waters. They are especially valuable in anæmia, scrofula, and poverty of the blood.

Saline waters contain common salt and other ingredients. They are valuable in the promotion of digestion and the assimilation of food, but, in large doses, they act as an emetic and purgative. Not more than from one to five drams of salt should be taken in twenty-four hours. In inflammation of the stomach and dyspepsia, they are often of benefit if taken hot before breakfast. The most palatable form of these waters is that naturally charged with carbonic acid gas.

Calcareous waters contain the salts of lime and are easily recognizable by their hard qualities. They are beneficial in rickets in children, inflammation of the bladder, and diabetes; but the important objection to their use is their interference with digestion.

Sulphur waters contain a solution of hydrogen sulphide acid. They are usually disagreeable in taste. They stimulate secretions and induce perspiration. In addition to their internal use, they are of great value as baths, especially in cases of chronic affections of the skin; rheumatism

and gout; neuralgia; paralysis; enlarged joints with contracted muscles or tendons are also much benefited by their use.

Hunyadi Janos Water.

Sulphate of Lime,.....1½ ounces.
Glauber Salts,.....24 ounces.
Epsom Salts,.....26 ounces.
Sulphate of Potassa,.....1 dram.
Pure Spring Water,.....10 gallons.

Vichy Water.

Carbonate of Ammonia,.....10 grains.
Bicarbonate of Soda,.....5½ ounces.
Common Salt,.....6 drams.
Phosphate of Soda,.....25 grains.
Sulphate of Soda,.....4 scruples.
Sulphate of Potassa,.....2 drams.
Pure Spring Water,.....10 gallons.

Congress Water.

Calcined Magnesia,.....1 ounce.
Bicarbonate of Soda,.....20 grains.
Hydrate of Soda,.....23 grains.
Common Salt,.....7¾ ounces.
Pure Spring Water,.....10 gallons.

Carlsbad Water.

Sulphate of Soda,.....100 grains.
Carbonate of Soda,.....25 grains.
Sulphate of Magnesia,.....15 grains.
Chloride of Sodium,.....16 grains.
Chloride of Calcium,.....15 grains.
Tartrate of Iron and Potassa,.....10 grains.
Pure Spring Water,.....10 gallons.

Seltzer Water.

Bicarbonate of Soda,.....5½ ounces.
Carbonate of Magnesia,.....7 drams.
Marble Dust,.....½ ounce.
Muriatic Acid (C. P.),.....5¾ ounces.
Pure Spring Water,.....10 gallons.

KISSINGEN WATERS.

Bicarbonate of Soda,	1 dram.
Carbonate of Lime,	2 drams and 2 scruples.
Precipitate Carbonate of Iron,	2 scruples.
Phosphate of Lime,	2 drams and 2 scruples.
Phosphate of Soda,	13 grains.
Sulphate of Magnesia,	2 ounces.
Sulphate of Soda,	2 drams and two scruples.
Muriate of Ammonia,	4 grains.
Common Salt,	8 ounces.
Pure Spring Water,	10 gallons.

ELECTROTHERAPY.

It is in cases of nervous affection that electric treatment is most beneficial.

Galvanism or galvanic electricity is that form which is generated by chemical action. It is also known as voltaic electricity. The current is either constant or may be interrupted by artificial means, and, according to the mode of interruption, is known as slowly or rapidly interrupted. Galvanism produces a sensation of prickling and heat attended by redness. When applied in sufficient intensity and for a long period, inflammation and even sloughing of the parts will follow. Among the uses of galvanic electricity in therapeutics are:—

1. Experience of the nerves and skin.
2. Destruction of the outer skin or of tissues, as in electro-cautery or burning.
3. Application of heat to a part, as in electrical heaters.
4. To restore power to a paralyzed muscle.
5. To increase the contractile power of a muscle.

Faradism is the use of induction currents in the treatment of disease. It is a more powerful stimulant and excitant than is galvanism. The current passes through a wire and, without contact, excites a current in a second wire placed parallel to it.

Multiple Neuritis.—This responds best to electrical treatment. Use the rapidly interrupted faradic current when there is loss of sensation and of power; but not when there are signs of pain or of extreme sensitiveness. Muscles which are affected by loss of power may be exercised by the slowly interrupted faradic current, but not to the point of exhaustion.

Facial Paralysis.—Electrical treatment is of little value, as the muscles would be fatigued before sufficient trophic impulse could reach them.

Paralysis Agitans or Shaking Palsy.—As a rule, electrical treatment is of no benefit.

Hysteria.—Where there is local loss of sensation, the rapidly interrupted faradic current is of benefit when applied by the wet sponge, or, in severe cases, by the dry wire brush. The dry electric brush is often of great benefit by reason of the mental impression made upon the patient.

Neurasthenia or Nervous Prostration.—The slowly interrupted faradic current every day; one treatment without exhaustion is beneficial, especially if alternated with massage. This gives the necessary exercise without fatigue. The general application of the rapidly interrupted current, not to exceed fifteen minutes' duration, is also helpful.

Locomotor Ataxia.—Electricity, in the form of the galvanic current, is of benefit in some cases. The positive pole is placed on the neck and the negative pole over the sacrum and, again, at the soles of the feet. Large electrodes are of benefit, as by their use the current is made to influence an extensive area. The effect of this is purely sedative.

Infantile Spinal Paralysis.—The slowly interrupted faradic current is applied to the paralyzed muscles and especially to those only partly paralyzed. The effect is stimulation of their nutrition and the prevention of atrophy. If too strong a current is used, or if the period of application is long enough to produce fatigue, atrophy of the parts is hastened. All inflammation must have subsided from the spinal cord before electricity is used or it will produce serious results. The child must not suffer in the least from the strength of the current.

Neuritis.—Faradic electricity of moderate strength may be used over the area supplied by the affected nerve. This has the effect of restoring sensation to the part and, by the faradic contractility of the muscle, to bring back the lost motor power. Once a day, and then for only a few minutes, is sufficient treatment. If exhaustion follows, the treatment should be discontinued.

PHOTOTHERAPY.

Phototherapy is the treatment of disease by exposure to light. Ordinary white sunlight or electric light may easily be broken up by means of a glass prism into the spectrum composed of the seven constituent colors: violet, indigo, blue, green, yellow, orange, and red. Sunshine is undoubtedly a disinfectant and a germ killer. The uses of light and its chemical effects in photography are familiar to every one. The

sunburn and tan resulting from exposure to the sun is a chemical effect of the light of the sun, and not a result of the heat. The chemical rays of the sun, or of all white light, are those which produce these and other chemical effects, and are the violet, ultra-violet, and the blue rays. That red has no chemical action is abundantly proven by the use of the ruby light in the dark room by photographers while developing the most rapid plates.

White light is of little use as a curative or therapeutical agent because its action is so slow. When the rays are focused by means of the familiar burning glass, the action is intensified. But the best results come from the use of the violet, ultra-violet, and blue rays, which produce the chemical effects. The treatment and methods are referred to as the Finsen light, from the name of the doctor in Norway who has perfected the system. In its simplest form, the apparatus consists of an eight-inch flat brass ring, to which is fitted on one side a curved glass and on the other a flat glass with a space between filled with a weak ammoniacal solution of copper sulphate, which is of a bright blue color. As the rays of white light pass through this convex lens, the liquid absorbs most of the ultra-red, red, and yellow rays, by which most of the heat is conveyed, and so the light is cooled. The dosage is controlled by the intensity of the light, the size of the lens, the distance from the patient, and the length of time to which the patient is subjected to exposure.

Sunlight is the best source of light, but arc lights are most convenient. Incandescent will not do, as they are of low power and are shielded by white glass, which interferes with the efficiency. This interference was accidentally proven by the 308,000 candle power arc light at Niagara Falls, used in electric drilling; the highest power electric light known. Workmen exposed to the action of this powerful light for only a few minutes suffered intensely from pain in the eyes. But plain white spectacles afforded absolute protection against its effects.

Only the part of the body to be treated is exposed to the light. The ordinary sitting is one hour a day. In cases of lupus and similar growth, the treatment may extend over months or even a year. But the results which have been secured, not only in the direction of a positive cure, but in the healing with slight disfigurement, abundantly reward the patience of both sufferer and operator. Besides, the painless nature of the treatment is vastly preferable to the use of the knife. Some of the quickest results have been obtained, however, by the combination of a surgical operation and subsequent Finsen light treatment.

Among the diseases which have been reported upon most encourag-

ingly as yielding to the Finsen treatment are: lupus, rodent or eating ulcer, tuberculosis, numerous skin diseases, stiffness of the joints, rheumatism, asthma, bronchitis, and sciatica.

A system of baths, hot and cold pack, massage, and Swedish movements are operated successfully in conjunction with phototherapy.

HYPNOTISM IN SURGERY.

The word "hypnotism" dates only from the middle of the nineteenth century, when James Braid, a British surgeon, coined the name "neurohypnotism" for certain psychic phenomena which had been receiving great attention for half a century. Neurohypnotism means nerve-sleep, and was soon shortened to hypnotism.

The thing itself is almost as old as the human race. Under various forms and names, and more or less mixed with charlatanry, it was the stock in trade of the magicians of ancient Egypt and Chaldea, of Hindu ascetics, and of medicine men of savage tribes. Modern hypnotism made its début under the name of mesmerism in 1778. In that year a German, Dr. Mesmer, began to astonish Paris with his hypnotic therapeutics.

Dr. Braid Took It up in England, practicing it successfully, and writing several books on the subject. During the latter part of the nineteenth century there was quite a revival of interest, due largely to the investigations and experiments of French physicians. They divided into two "schools" of hypnotism under the leadership of Charcot in Paris and of Bernheim at Nancy. Both accomplished wonderful results, but differed mainly in their theories of the nature of hypnosis; the first faction regarding it as a diseased condition, the second as normal. But together they succeeded in raising such a cloud of discussion and uncertainty about the whole subject as to bring it into discredit with strictly scientific men, and there it remains to-day.

As a Natural and Unfortunate Result, an abounding richness of misinformation is current among the laity in regard to hypnotism, especially in surgery. This has been helped along materially by ignorant and unscrupulous persons for their own purposes. It has been stated, both orally and in print, and is currently believed, that under hypnosis teeth are frequently extracted, and even legs and arms cut off. Little, if any, of this is true.

Why Not?—In the first place, it is too risky. Hypnosis, so complete as to permit of safe and painless surgery, would need to pass into the third stage, and sometimes patients cannot be brought back from the

depths of the third stage. Again, it is unsatisfactory. Either the sleep is not deep enough, or it is so deep as to be dangerous, for patients differ greatly in susceptibility. Furthermore, the general opinion among physicians is that the complete surrender of the will requisite for hypnotism is not beneficial to the patient's personality. When local anæsthesia may be obtained so satisfactorily by means of cocaine or freezing, and general anæsthesia by ether, chloroform, nitrous oxide, or scopolamine, surgeons do not care to spend time or take chances with hypnotism.

Suggestion, either with or without hypnotism, is credited by many people with miraculous curative powers, extending even to surgery. Such extremists will often go so far as to claim that it can cause dislocated bones to fly back into their sockets, broken bones to knit, and hemorrhages to cease beyond the ordinary phenomena of Nature. Of course these are merely examples of the well-known and fully recognized influence of the mind over the body, distorted and exaggerated to fit a theory. Every intelligent person knows, from both observation and personal experience, that the state of mind has much to do with bodily functions and conditions, and *vice versa;* but that does not justify trying to substitute hypnotism for surgery. The true therapeutic use of hypnosis and suggestion lies, therefore, in that range of *palliative* influences of which the mind is known to be capable. But it cannot properly be classed as a curative agent, in the sense that it directly causes the expulsion or death of disease germs, or the reduction of dislocated bones.

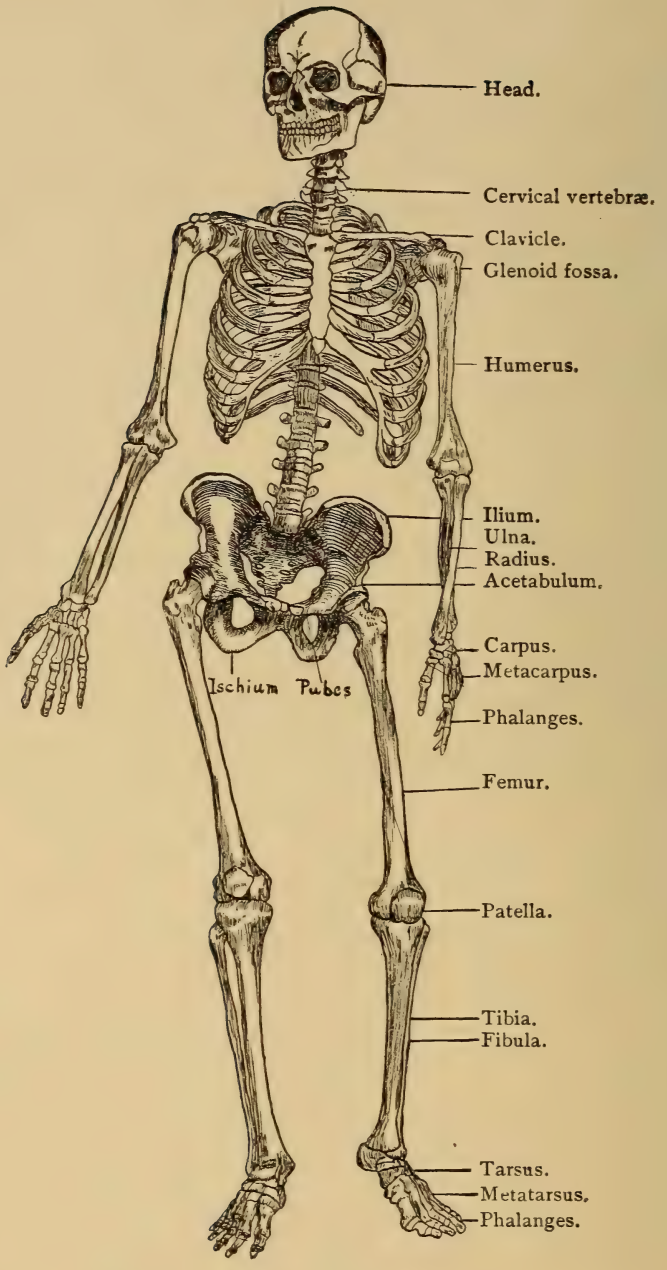


FIG. 137. HUMAN SKELETON.

BOOK X.

ANATOMY AND PHYSIOLOGY.

CHARLES H. CLEMMER, M.A.
State Institute Conductor of Teachers' Institutes.

Anatomy treats of the structure and organization of living beings. *Comparative anatomy* compares the structure of different kinds and classes of animals. *Histology* is microscopic anatomy.

Physiology deals with the uses, or functions, of the different parts of living beings, and the manner of their working.

Hygiene treats of the conditions of life which promote health.

Protoplasm, the so-called physical basis of life, is a mixture of spongioplasm and hyaloplasm, which constitutes the main bulk of the bodies of most cells. It possesses vital properties whereby the processes of nutrition, secretion, and growth go forward; such as contractility, irritability, metabolism, reproduction.

Tissues are the primary building material that enters into the construction of the body. They are made up of cells.

Cells, when fully formed, consist of (1) a *cell body* (protoplasm); (2) a *cell nucleus,* which is less granular than the cell body and embedded in it; (3) the *nucleolus,* a tiny dot lying in the nucleus. These cells are very small and are seldom more than one-thousandth of an inch in diameter. They differ in shape. As a rule, they are either rounded and thick, as those which float in the blood; flattened and thin, as those of the membranes; or elongated to form slender threads, known as fibers. Long fibers are often made up of elongated cells, joined end to end. The life of the cells is very brief. They are reproduced by dividing themselves into two parts, each half soon forming a new cell exactly like the old one from which it sprang. The process by which living cells are nourished by the nutritive material of the blood, or that by which they transform their cell protoplasm into other substances, is known as *metabolism;* hence it may be either constructive or destructive.

An *organ* is a distinct portion of the body capable of performing some special action (function), as the liver, the heart.

A *system* consists of several different organs, of similar structure, spread throughout the body, and performing similar functions, as the nervous system.

An *apparatus* is a number of organs which work together to accomplish a particular object, as the digestive apparatus.

A *function* is the work done by a healthy organ in the body, as the function of the liver in the secretion of bile.

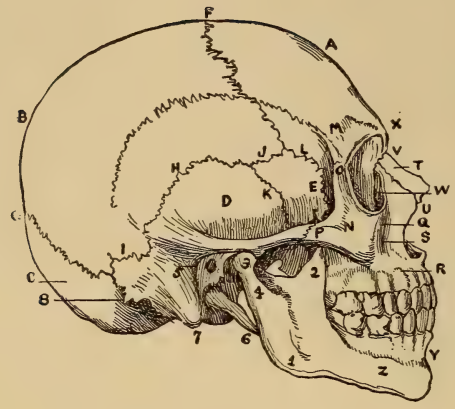


FIG. 138. THE SKULL.

A, Frontal bone. B, Parietal bone. C, Occipital bone. D, Temporal bone. E, Large wing of sphenoid bone. F, Lambdoid suture. G, Occipito-parietal suture. H, Squamoparietal suture. I, Mastoparietal suture. J, Sphenoparietal suture. K, Sphenotemporal suture. L, Sphenofrontal suture. M, Temporal ridge. N, Malar or cheek bone. O, Frontomalar suture. P, Malotemporal suture. Q, Malomaxillary suture. R, Superior maxillary bone. S, Infraorbital foramen. T, Nasal bone. U, Nasomaxillary suture. V, Nasofrontal suture. W, Lachrymal groove. X, Nasal eminence. Y, Inferior maxillary bone. Z. Mental Foramen. 1, Angle of lower jaw or Ramus. 2, Coronoid process. 3, Condyle. 4, Neck of condyle. 5, External auditory canal. 6, Styloid process 7, Mastoid process. 8, Mastooccipital suture.

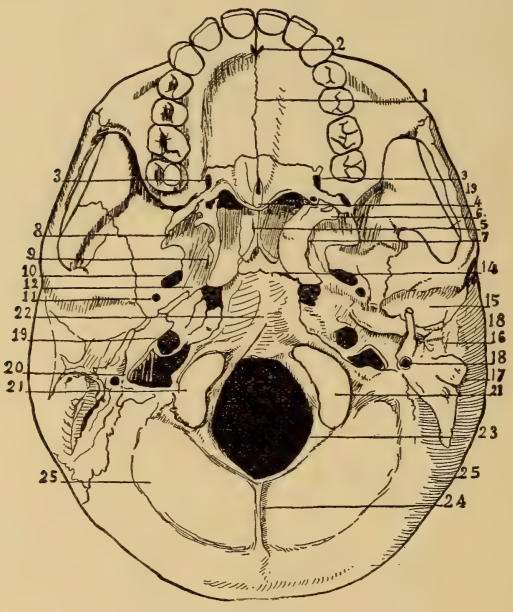


FIG. 139. BASE OF THE SKULL.

1, Suture of the palatine vault or roof of the mouth. 2, Anterior palatine canal. 3, Posterior palatine canal. 4, Posterior nasal spine. 5, Posterior border of nasal septum. 6, Process of sphenoid bone. 7, Internal pterygoid (wing-shaped) plate. 8, External pterygoid plate. 9, Scaphoid fossa. 10, Oval foramen. 11, Spinous foramen. 12, Foramen lacerum medium. 13, Zygomatic arch. 14, Union of the sphenoid and occipital bones. 15, Glenoid cavity into which the lower jaw bone fits. 16, External auditory canal. 17, Mastoid process; large eminence behind the ear. 18, Styloid process. 19, Lower opening of the carotid canal. 20, Foramen lacerum posterius. 21, Occipital condyles which rest on the articular surfaces of the axis. 22, Basilar process. 23, Foramen magnum, through which the medulla oblongata or spinal cord passes. 24, External occipital crest. 25, Inferior curved lines of occipital bones to which muscles are attached.

STRUCTURE OF THE BODY.

The human body is composed of solids and fluids. The fluids are most abundant in children and youth. It is this which gives softness and pliancy to their flesh. In old age, the fluids are less abundant, and the flesh is more hard and wrinkled. The fluids contain the whole body, as it were, in a state of solution; or rather, they hold the materials out of which it is manufactured.

CHEMICAL PROPERTIES OF THE BODY.

Seventeen *elements* have been found in the human body, viz., oxygen, carbon, hydrogen, nitrogen, sulphur, phosphorus, chlorine, fluorine, silicon, sodium, potassium, lithium, calcium, magnesium, iron, manganese, iodine. The first four make up nearly the whole bulk of the fluids and soft solids; the remaining, chiefly in a state of combination, and in much smaller quantities, enter into several of the tissues.

The chemical compounds existing in the body may be classed as *organic* and *inorganic*. The former contain carbon, hydrogen, oxygen, and some nitrogen; the chief kinds are albumens, fats, and carbohydrates. If dried they will burn. The most important are water, common salt, phosphate, and carbonate of lime.

Albuminous or *proteid* substances are known only as obtained from living beings and have never been artificially constructed in the laboratory. The most important are *serum albumen,* which is very like egg albumen, and is found dissolved in the blood; *fibrin,* which forms in the blood when it clots; *myosin,* which is found in the muscles; *casein,* found in milk.

Fats consist solely of carbon, hydrogen, and oxygen. The chief fats in the body are *palmitin, stearin,* and *olein.*

Carbohydrates belong to the same class of substances as starch and sugar. The most important is *glycogen,* a sort of starch found stored up in the liver and muscles.

PHYSICAL PROPERTIES OF THE BODY.

The Tissues.—The solid organized substances of which the human body is composed are called tissues. The more important are the cellular or areolar, mucous, serous, dermoid, fibrous, cartilaginous, bony or osseous, muscular, adipose, nervous. These will be considered in more detail in connection with the special organs.

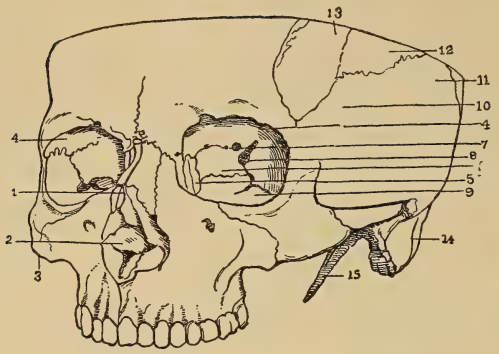


FIG. 140. NASAL AND ORBITAL CAVITIES.

1, Opening of the nasal fossa. 2, Extremity of the inferior turbinated bone. 3, Malar or cheek bone. 4, Orbital cavities or sockets. 5, Lachrymal canal through which the tear ducts pass. 6, Os planum of the ethmoid bone. 7, Optic foramen through which the optic nerve passes. 8, Sphenoid fissure connecting the orbital and cranial cavities. 9, Fissure between the sphenoid and superior maxillary bones. 10, Great wing of the sphenoid bone. 11, Squamous (thin or scale-like) portion of the sphenoid. 12, Parietal bone. 13, Part of the frontal bone. 14, Mastoid process. 15, Styloid (pen-shaped, long, pointed) process.

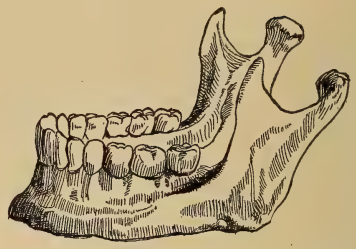


FIG. 141. INFERIOR MAXILLARY BONE OR LOWER JAW BONE.

FIG. 142. THE HYOID BONE.

The U-shaped bone at the base of the tongue.

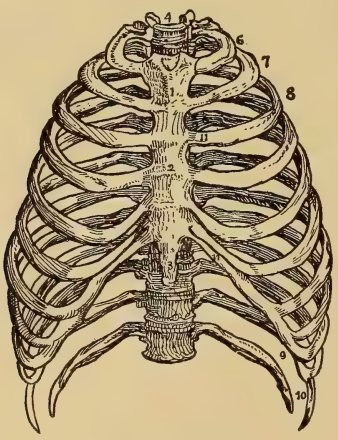


FIG. 143. THORAX.

1, 2, 3, The sternum or breastbone, likened to a sword, of which 1 is the manubrium or handle; 2, The gladiolus or little blade. 3, The ensiform cartilage or xiphoid (fish-like) process. 4, The first dorsal vertebra. 5, The 12th dorsal vertebra. 6, The first rib. 7, Second rib. 8, Third and succeeding ribs. 9, 8th, 9th, and 10th ribs. 10, 11th and 12th ribs, known as floating ribs. 11, The costal cartilages which fasten ends of 8th, 9th, and 10th ribs.

THE SKELETON.

The human skeleton is composed of *bone, cartilage,* and *connective tissue,* and consists of more than two hundred separate bones, though the actual number of distinct bones varies at different periods of life; many bones which are separate in youth becoming united in old age.

The *bones* form the framework of the body, provide levers for the muscles, and surround cavities containing delicate organs, as the brain, heart, spinal cord, etc.

Cartilage is found at the ends of bones, where it forms elastic pads for the joints; it is sometimes used in place of bone, as at the anterior ends of ribs.

Connective tissue, in the form of stout cords (ligaments), binds bones together; as tendons, it attaches muscles to bones; as periosteum, it is concerned in nourishing the bones.

Articulations are points where the bones meet.

Joints are articulations in which a considerable range of movement is permitted.

THE BONY SKELETON.

The bony skeleton is usually considered under two parts: the *axial* skeleton and the *appendicular* skeleton.

The *axial skeleton* supports the head, neck, and trunk; it is composed of the skull, hyoid bone, vertebral column, ribs, and sternum.

The *appendicular skeleton* supports the limbs and attaches them to the trunk; it consists of the *pectoral* and *pelvic* girdles, and the limb bones themselves.

The *pectoral arch* or girdle consists of two bones: a collar bone (clavicle) and a shoulder blade (scapula) on each side.

The *pelvic arch* or girdle consists of a single bone (*os innominatum*) on each side.

The *skull* is composed of twenty-eight bones distributed as follows: *cranium,* eight; inside of the ears, six; *facial,* fourteen; the *hyoid bone* has the tongue attached to it, the bone itself being attached to the under surface of the skull by ligaments.

The *vertebral column* consists of twenty-four vertebræ: seven cervical; twelve dorsal; five lumbar.

The *sacrum* is below the separate vertebræ and the *coccyx* is at the tip of the spine. In adults the sacrum and coccyx consist of one bone each; in children, of five and four respectively. There are twenty-four

FIG. 144. CLAVICLE OR COLLAR BONE.

FIG. 145. SCAPULA OR SHOULDER BLADE.

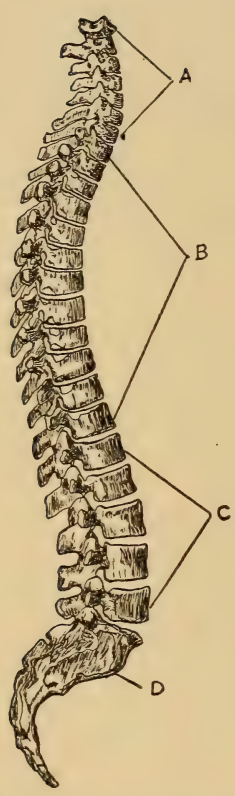


FIG. 146. SPINAL COLUMN OR BACK-BONE

A, The seven cervical vertebræ. B, The twelve dorsal vertebræ. C, The five lumbar vertebræ. D The sacrum and coccyx.

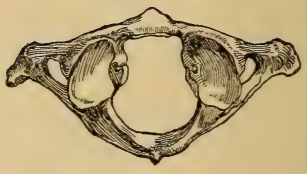


FIG. 147. ATLAS.

The 1st cervical vertebra, upon which the skull rests. It permits the nodding motion of the head. Its body is formed by the odontoid process of the axis.

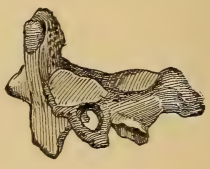


FIG. 148. AXIS.

The 2d cervical vertebra. It permits the turning of the head from side to side. The upper projection is the odontoid process around which the atlas fits.

ribs, twelve on each side; ending, ventrally, in a costal cartilage. To the sternum, or breastbone, are attached most of the ribs and the inner ends of the two clavicles.

There are two *clavicles* or collar bones, one on each side of the sternum, their outer ends being attached to the scapulas, and their inner ends to the sternum.

The two *scapulas,* or shoulder blades, lie on the back of the chest outside the ribs.

Bones of the arms (thirty in each): *humerus,* extends from the shoulder to the elbow; *radius* (forearm bone, thumb side); *ulna* (second forearm bone); eight *carpal* (in the wrist); five *metacarpal* (in the palm of the hand); fourteen *phalanges* (two for the thumb and three for each finger).

Ossa innominata, one on each side.

Bones of the lower limbs (thirty in each): *femur* (thigh bone); *tibia* (lower leg, inside); *fibula* (lower leg, outside); *patella* (kneecap); seven *tarsal* (below the ankle joint); five *metatarsal* (in the front half of the sole of the foot); fourteen *phalanges* (two in the great toe and three in each of the others).

BONES.

Structure.—When alive, the bones have a bluish-white color, with a pinkish hue if blood is flowing through them. They have considerable flexibility and elasticity. The outer layer is compact, while the inner portion is spongy and contains red marrow, which is quite different from the yellow fatty marrow of the medullary cavity. Compact bone is porous. Its cavities are much smaller than those of spongy bone and the hard bony plates between them are thicker.

Chemical Composition.—Bones are compounded of mineral and animal matter; from the former, phosphate and carbonate of lime, they receive their strength; from the latter, cartilage, they derive their life.

Growth and Nourishment.—*Periosteum.* The blood circulates through the bones, thus nourishing them. The periosteum and marrow are necessary to their growth. The blood vessels and nerves spread and divide in them before entering the bone proper. The periosteum seems to be a part of the bone. If removed, the bone dies, but if the bone be removed so as to leave the periosteum in its place, the bone will grow again.

Haversian Canals; Canaliculi.—The former are tubes that run through the bone, most of them in the direction of its long axis. They

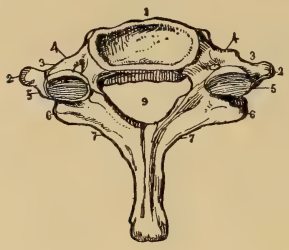


FIG. 149. 7TH CERVICAL VERTEBRA.

The long projection at the lower part of the figure is the process to which one end of the ligamentum nuchæ (which holds up the head) is attached. 1, Body. 2, Transverse processes. 3, Anterior roots. 4, Openings for the vertebral arteries. 5, Superior articular processes. 6, Inferior articular processes. 7, Laminæ. 9, Spinal foramen through which the spinal cord passes.

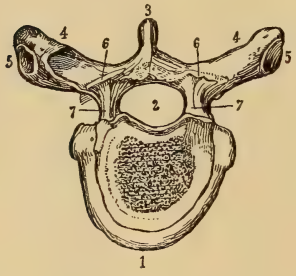


FIG. 150. DORSAL VERTEBRA.

1, Front surface and body. 2, Spinal foramen. 3, Spinous process. 4, Transverse processes. 5, Surfaces to which the ribs are attached. 6, Upper articular surfaces. 7, Pedicles.

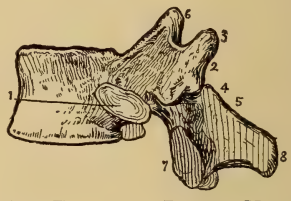


FIG. 152. THE 12TH DORSAL VERTEBRA.

1, Attachment of the head of the 12th rib. 2, Transverse process. 3, Tubercle of transverse process. 4, Lower tubercle. 5, Front tubercle. 6, Upper articular process. 7, Lower articular process. 8, Spinous process.

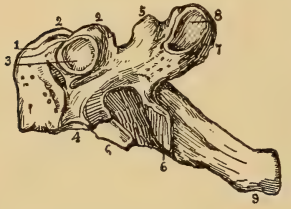


FIG. 151. THE 1ST DORSAL VERTEBRA.

1, Upper surface of the body. 2, semi-lunar processes. 3. Surface to which the first rib is attached. 4, Half of the surface to which the second rib is attached. 5, Upper articular surface. 6, Lower articular surface. 7, Transverse process. 8, Facet for tubercle of the first rib. 9, Spinous process.

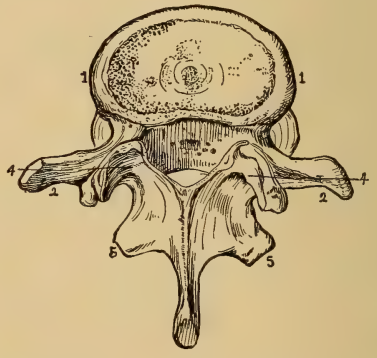


FIG. 153. A LUMBAR VERTEBRA.

1, Surfaces of the body. 2, Transverse processes. 3, Spinous process. 4, Upper articular process. 5, Lower articular process.

are united by numerous cross branches, the outermost of which open on the surface of the bone beneath the periosteum where blood vessels enter to carry materials for the bone's growth and nourishment.

The *canaliculi* are extremely fine tubes through which liquid, which transudes from the blood vessel in the Haversian canal, can ooze through the bone.

Shapes.—Bones are of different shapes: *long,* as the clavicle, the humerus; *short,* as the carpal and tarsal; *flat,* as those of the skull; *irregular,* as the vertebræ.

Joints.—These are of several varieties: *ball and socket,* as those of the hips and shoulders; *hinge,* the lower jaw bone is hinged to the cranium; *pivot,* the first and second cervical vertebræ enable the skull to turn to the right and left; *gliding,* as those of the closely packed bones of the carpus and of the tarsus. The joints are moistened by the synovial membranes which line them.

Comparison of the Upper and Lower Limbs.—The pectoral arch answers to the pelvic; the humerus, to the femur; the radius and ulna, to the tibia and fibula; five metacarpal bones, to five metatarsal; fourteen phalanges in the digits of the hand, to fourteen in the digits of the foot; elbow and wrist joints, to knee and ankle. The arm has no separate bone at the elbow to correspond to the patella, but the ulna bears a bony process which in early life is a separate bone and may be considered as corresponding to the patella. The adult carpus has eight bones, the tarsus but seven, but, in early life, one of the tarsus (the astragulus) consists of two bones. The elbow joints bend ventrally and the knee joints dorsally. The arms have light and movable parts and serve as prehensile organs; the legs are heavy and they are firmly knit so as to carry the weight of the body. The lower limbs are proportionally much longer in man than the arms, thus making possible a more rapid progression on the legs, and a longer stride.

The spinal column widens gradually from the neck to the sacrum and has four curvatures which add to its springiness and prevent the transmission of sudden jars. Between the bodies of the twenty-four vertebræ are placed elastic cushions known as intervertebral disks. These intervertebral disks allow of a certain range of movement between each pair of vertebræ. They also aid in protecting the spinal cord from injury. Each vertebra consists of the body, a neural arch, a neural ring, and bony processes which project from the body and the arch. The successive neural rings form the neural tube, in which lies the spinal cord. Nerves pass into or out from the spinal cord through the *inter-*

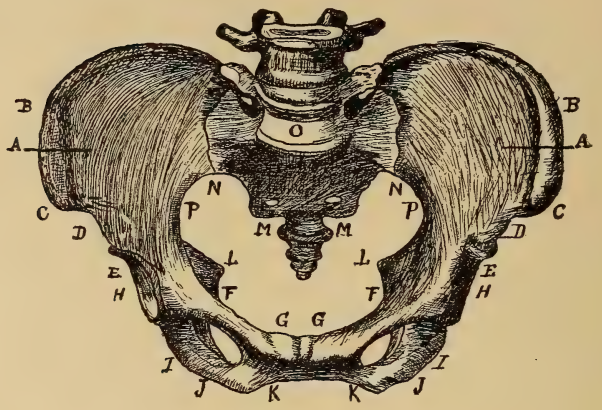


FIG. 154. PELVIS. FRONT VIEW.

A, Interior iliac fossa. B, Iliac crests. C, Anterior upper iliac spines. D, Anterior lower iliac spines. E, Iliopectineal eminences. F, Horizontal branches of the pubes. G, Bodies and symphysis of pubes. H, Acetabulum into which the head of the femur fits, forming the hip joint. I, Tuberosity of the ischium. J, Ascending branch of the ischium. K, Descending branch of the pubis. L, Spine of the ischium. M, Coccyx. N, Union of the sacrum and the ischium. O, Union of the vertebral column and the sacrum. P, Posterior strait of the pelvis.

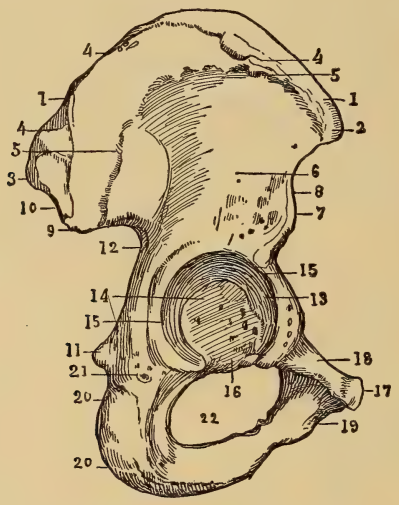


FIG. 155. OS INNOMINATUM.

The unnamed bone, so-called from its irregular shape. 1, Upper border or crest. 2, Front, upper iliac spine. 3, Rear, upper iliac spine. 4, Upper curved line. 5, Lower curved line. 6, Space between the upper curved line and acetabulum. 7, Front, lower iliac spine. 8, Front interspinous notch. 9, Rear, lower iliac spine. 10, Rear interspinous notch. 11, Spine of the ischium. 12, Great sacrosciatic notch. 13, Acetabulum into which the head of the femur fits forming the hip joint. 14, Bottom of the acetabulum. 15, Border of the acetabulum. 16, Cotyloid notch (a cup-shaped depression). 17, Spine of the pubes, the front portion of the bone. 18, Horizontal branch of the pubes. 19, Lower branch of the pubes. 20, The ischium, the part upon which the body rests when sitting. 21, Groove through which the obturator externus muscle passes. 22, Obturator foramen.

vertebral foramina, apertures leading into the neural canal. While the vertebræ resemble one another in general form, the first and second cervical vertebræ differ considerably from the others. The first (the atlas), which carries the head, has a very large neural ring. The second has a peg which forms a pivot around which the atlas rotates, thus allowing the head to be turned from side to side.

THE HEAD.

The head consists of the *cranium* and the *face;* the former contains the brain. The *skull,* or skeleton of the head, in early adult life, contains twenty-two naturally separate bones, but in youth the number is greater; in old age, less. Eight of these form the cranium; fourteen, the face. Those of the cranium are arranged so as to inclose the brain case and to protect the deep parts of the ear. As a general rule, they are expanded and plate-like in form. The edges of some of them interlock in a manner similar to the dovetail joints of cabinet makers, the joints being known as *sutures.* The whole structure is marvelous for its strength and lightness. Between the interior and exterior wall of the frontal or forehead bone are two hollow chambers, known as the *frontal sinuses,* which cause those bulgings at the upper edges of the orbits, and which shelter and protect the eyes in the hollows beneath.

On the underside of the cranium are many small apertures for nerves and blood vessels to pass in or out, and one large opening, the *foramen magnum,* for the spinal cord.

Fourteen bones support the face and surround the mouth and the nose, and, with the aid of some of the cranial bones, form the eye sockets. The bones of the face, as a rule, are much smaller than those of the cranium. Some have the form of thin scales, while others are more irregular in shape. They consist of two superior maxillary, or upper jaw bones; two palate bones; two malar, or cheek bones; two nasal bones roofing in the nose; two lachrymal bones, very thin and small and lying between the nose and the orbit; two inferior turbinate bones lying inside the nose, one in each nostril chamber; a vomer and an inferior maxilla.

In its general form, the skull is ovoid, the average capacity of the brain cavity being ninety-two cubic inches. The skull of a woman is smaller and lighter than that of a man.

THE MUSCLES.

The muscles, numbering more than 500 and varying from one-sixth of an inch to nearly two feet in length, cover the skeleton almost entirely.

FIG. 156. HUMERUS OR LONG BONE OF THE UPPER ARM.

FIG. 157. RADIUS (SHORTER) AND ULNA (LONGER) BONES OF THE LOWER OR FORE ARM.

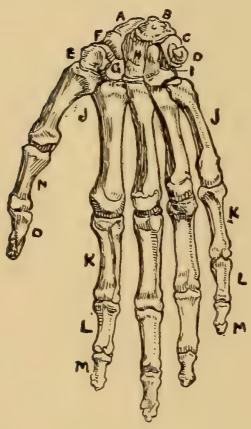


FIG. 158. BONES OF THE HAND. PALM UPWARD.

A, Scaphoid, B, Semilunar. C, Cuneiform. D, Pisiform. E, Trapezium. F, Groove in which runs the tendon of flexor carpi radialis. G, Trapezoid. H, Os magnum. I, Unciform. J, Metacarpal bones. K, First phalanges of the fingers. L, Second phalanges of the fingers. M, Third phalanges of fingers. N, First phalanx of the thumb. O, Second phalanx of the thumb.

FIG. 159. BONES WHICH FORM THE WRIST JOINT.

R, Radius. U, Ulna. S, Scaphoid. L, Semilunar. C, Cuneiform. P, Pisiform. T, Trapezium. T (inner) Trapezoid. M, Os magnum. U, Unciform. 1, 2, 3, 4, 5, metacarpal bones.

By their contractility, they cause the different bones to move upon each other, invest and defend them, hold them together at the joints, and inclose cavities, as the abdomen and mouth. Most are rounded but some are flat, as those on the sides of the abdomen. They consist of a soft red middle part (belly) tapering toward each end into tendons which attach the muscles to parts of the skeleton. There are numerous varieties: *simple* (tapering toward each end); *biceps* or two-headed (divided at one end); *triceps* (three-headed), as at the back of the upper arm; some have no tendon at either end, the belly itself being attached to the bone; *penniform* (featherlike), where a tendon runs along the side of a muscle and the fibers are attached to it obliquely; *bipenniform,* where a tendon runs down the middle of the muscle; *digastric* (two-bellied), where a tendon is found in the middle of the belly and at each end; *polygastric* (having more than two bellies, as the two straight muscles along the front of the abdomen, each of which consists of four bellies separated by short tendons).

Muscle is composed of bundles of parallel fibers placed side by side, and supported and held together by a delicate web of areolar tissue; so that if it were possible to remove the muscular substance, we should have remaining a beautiful reticular framework, possessing the exact form and size of the muscle, without its color and solidity. Each bundle (a *fasciculus*) consists of a number of smaller bundles, and these of single fibers, which, from their minute size and independent appearance, have been called ultimate fibers; although microscopic examination informs us that each one of these is itself a fasciculus, made up of ultimate *fibrils,* inclosed in an extremely delicate sheath, called the *myolemma* or *sarcolemma.* The whole muscle is enveloped in a loose sheath of connective tissue, known as the *perimysium;* from it partitions run in and subdivide the belly of the muscle into bundles (*fasciculi.*).

Of the ultimate muscular fiber there are two sorts in the animal economy; that of voluntary or animal life, called striated muscle, and that of involuntary or organic life, termed smooth muscle. The former is known by its size, its uniformity of caliber, and especially by its transverse markings, which occur at minute and regular distances. It also presents markings, or striæ, in a longitudinal direction. The ultimate fibers, or fasciculi, are polyhedral in shape, this form being due to mutual pressure; and the sizes differ in different classes, genera, and even sexes of animals. The ultimate fibrils of animal life are beaded filaments, presenting a regular succession of segments and constrictions, the latter being narrower than the former, and the component substance

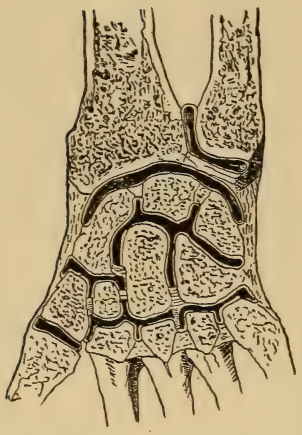


FIG. 160. SECTION OF THE WRIST JOINT.

Showing the relation of the bones of the wrist to one another and the separation by synovial membranes.

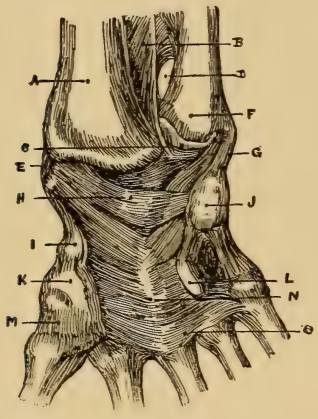


FIG. 161. LIGAMENTS WHICH BIND THE WRIST BONES TOGETHER.

Front view of the right hand. A, The radius. B, Membrane between the bones. C, Lower end of the ulna. D, Passage for the anterior interosseous artery. E, External side ligament of the wrist. F, The ulna. G, Front wrist ligament. H, Internal lateral ligament of the wrist. I, Scaphoid tubercle. J, Pisiform bone. K, Trapezium bone. L, Unciform bone. M, Point of union of the first metacarpal bone with the trapezium. N, Front carpal ligament. O, Ligaments uniting the metacarpal bones with the carpal bones and with one another.

FIG. 162. FEMUR OR LONG BONE OF THE UPPER LEG.

FIG. 163. TIBIA (LARGE BONE) AND FIBULA (SMALLER BONE) OF THE LOWER LEG.

probably less dense. The ultimate fibril of animal life measures two-thousandths of an inch and is composed of a succession of cells connected by their flat surfaces. Very different from all this, in its form and arrangement, is the ultimate fiber of organic life, it being a simple homogeneous filament much smaller than the fiber of animal life—flat, smooth, and without traverse markings. It is of a fusiform shape and various lengths and consists of a thin external membrane, blended with a soft, homogeneous, or finely granular contained substance. This kind of muscle is distributed very abundantly in the animal frame, and is met with in all situations where a distinct contractile power, independent of mere elasticity, is required.

Voluntary muscles are generally attached to the skeleton; involuntary are not attached to the skeleton directly, nor concerned in our ordinary movements. They lie in the walls of various hollow organs, as the stomach, the intestines, and the arteries, and by their contractions they move the contents of those cavities. Voluntary muscles have rapidity of action and are under the control of the will; involuntary, comparative slowness and act, as a rule, without our knowledge or consciousness. The muscular fibers of the heart are intermediate in structure, between the voluntary and involuntary kinds, thus making comparatively rapid action possible.

Muscles have cells, contractile elements, accessory connective tissues, blood and lymph vessels which convey nourishment and carry all waste matter, nerves which govern their activity, water (75 per cent), and salts. They are controlled by means of the brain and spinal cord through the nerves.

The *belly* is the working part of a muscle. The nerves when excited cause the muscles to contract and pull on the tendons, thus transmitting the pull to the parts to which they are attached. Every contraction is accompanied by a loss of or change of material. This waste is repaired by the minute muscular fibers or the cells composing them, taking from the blood proper food and appropriating it. When the waste of material is greater than the supply the muscles become *fatigued*. *Extreme* fatigue is dangerous because the muscular fibers may become so completely exhausted that their power of nourishing themselves may be seriously impaired or destroyed; on the other hand, if the muscles remain inactive, they waste away and become flabby until the muscular fibers disappear altogether, or are filled with little particles of fat which take the place of some of the muscular substance, thus making them weak and useless. The muscles should not be unduly exercised. It is less fatiguing to walk

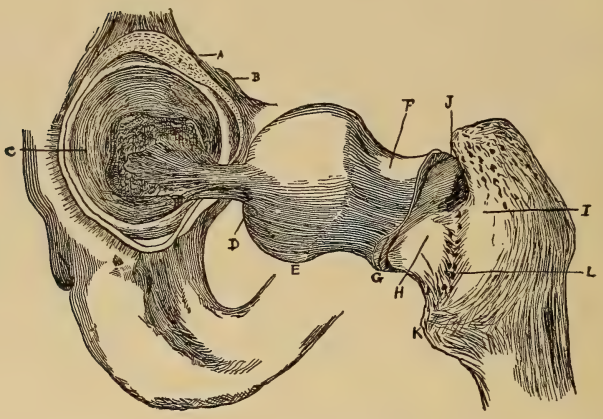


FIG. 164. LIGAMENTS AND DETAILS OF THE HIP JOINT.

A, Band of the capsular ligament cut across. B, cotyloid ligament. C, Ligamentum teres, the round ligament of the hip. D, Attachment of the ligamentum teres to the head of the femur. E, Head of the femur. F, Neck of the femur. G, Band of the capsular ligament cut away from the neck of the femur. H, Portion of the neck of the femur outside of the capsular ligament. I, Great trochanter, a process on the outside of the femur below the neck. J, Hollow of the great trochanter. K, Small trochanter on the inner side of the femur. L, Anterior line running between the two trochanters.

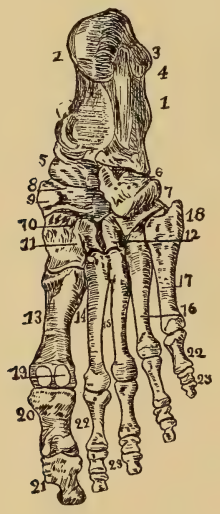


FIG. 165. BONES OF THE FOOT.

1, Os calcis. 2 and 3, Inner and outer tuberosities of os calcis. 4, Angular depression. 5, Astragalus. 6, Cuboid. 7, Tuberosity. 8, Scaphoid. 9, Tuberosity of scaphoid. 10, Internal cuneiform. 11, Middle cuneiform. 12, Apex of internal cuneiform. 13-17, Metatarsal bones. 18, Tuberosity of fifth metatarsal. 19, Two sesamoid bones. 20, 21, Phalanges of great toes. 22, 23, Phalanges of lesser toes.

an hour than to stand still an hour because in walking the muscles have short intervals of rest, but while we are standing still they have no rest as they are continually in a state of contraction. When a muscle is fatigued, it recovers very fast, if allowed to rest

THE BRAIN.

The brain lies in the skull and is continuous through the *foramen magnum* with the spinal cord, which lies in the vertebral column and which should be considered as part of the brain. Its soft pulpy masses are placed in almost completely closed bony cavities and enveloped by three membranes which give them support; viz., the *pia mater,* the *dura mater,* and the *arachnoid.* The *pia mater* is a very delicate tissue, containing many minute blood vessels, which are, in fact, the nutrient arteries of the brain, before entering which they divide and subdivide upon the external surface to an extreme degree of minuteness, so as to prevent the blood from entering the tender cerebral substance in too forcible a manner. The *dura mater* is a much coarser and stronger membrane, which lines the inner portion of the skull, and forms an external cover for the brain and its appendages. The outer surface of the pia mater and the inner surface of the dura mater pass into a delicate fibrous tissue, lined by an epithelium, which is called the *arachnoid* membrane. Thus one layer of arachnoid coats the brain and spinal cord, and another lines the dura mater.

In man the brain is larger and heavier than in the inferior animals except the elephant and the larger whales; that of an ox scarcely weighs a pound. The size and weight of the human brain vary not only in the different races of mankind but in individuals of the same race and in the two sexes, the average weight of which is from forty-nine to fifty ounces in the adult European male and from forty-four to forty-five ounces in the adult female. The average weight is considerably higher in civilized than in savage races. The brain reaches its maximun size between the third and eighth years, but it does not reach its maximum density until about the thirty-sixth year. After the age of sixty, the brain begins to diminish in weight.

Old People's Brains.—Persons in advanced life should be particularly careful not to overwork the brain. In middle life, it recovers easily from great fatigue. In the decline of life, its powers of recovery are feeble. A single exhaustion may cause its fatal collapse. Old age should be distinguished for gentleness and moderation.

Nearly everywhere, the surface of the brain is laid in folds, known

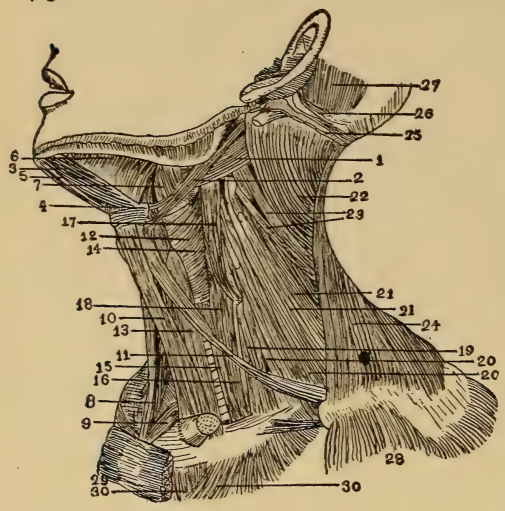


FIG. 166. MUSCLES OF THE NECK.

1, Frontal. 2, Occipital. 3, Aponeurosis. 4, Temporal. 5, Retrahens aurem (drawing back the ear). 6, Orbicularis palpebrarum. 7, Levator labii superioris et alæque nasi (Raiser of the upper lip and sides of the nose). 8, Dilator naris. 9, Compressor naris. 10, Zygomatic minor. 11, Zygomatic major. 12, Masseter. 13, Levator anguli oris. 14, Levator labii superioris. 15, Orbicularis oris. 16, Buccinator. 16A, Depressor anguli oris. 17, Depressor labii inferioris. 18, Levator labii inferioris. 19, Sternomastoid. 20, Trapezius. 21, Digastric and stylohyoid. 22, Anterior portion of digastric. 23, Pulley for the tendon of digastric. 24, Omohyoid. 25, Sternohyoid. 26, Thyrohyoid. 27, Mylohyoid. 28, Splenius capitis. 29, Splenius colli. 30, Levator anguli scapulæ. 31, Scalenus posticus. 32, Scalenus anticus.

1, Posterior portion of digastric. 2, Stylohyoid. 3, Anterior portion of digastric. 4, Tendon and pulley of digastric. 5, Anterior part of right digastric. 6, Mylohyoid. 7, Hyoglossus. 8, Part of right sternomastoid. 9, Part of left sternomastoid. 10, Sternohyoid. 11, Tendon of omohyoid. 12, Thyrohyoid. 13, Sternothyroid. 14, Inferior constrictor of pharynx. 15, Trachea. 16, Œsophagus. 17, Rectus capitis anticus major. 18, Longus colli. 19, Scalenus anticus. 20, Scalenus posticus. 21, Levator anguli scapulæ. 22, Splenius capitis. 23, Splenius colli. 24, Trapezius. 25, Part of sternomastoid. 26, Retrahens aurem. 27, Part of occipito-frontal. 28, Deltoid. 29, Pectorales majores (cut away). 30, External intercostal. 31, Internal intercostal.

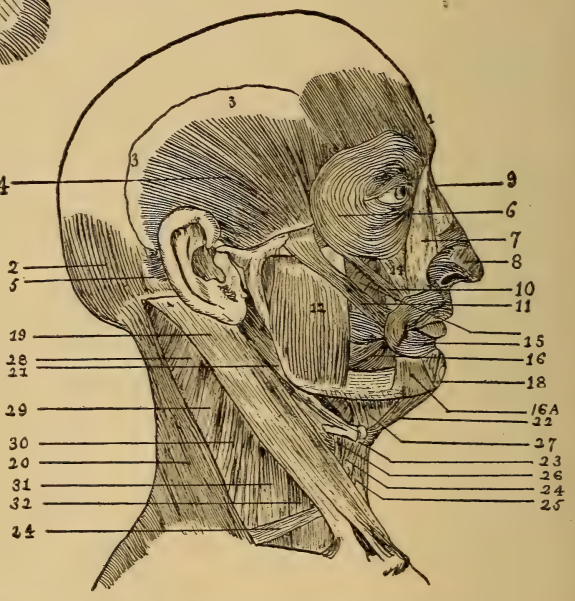


FIG. 167. MUSCLES OF THE FACE AND NECK.

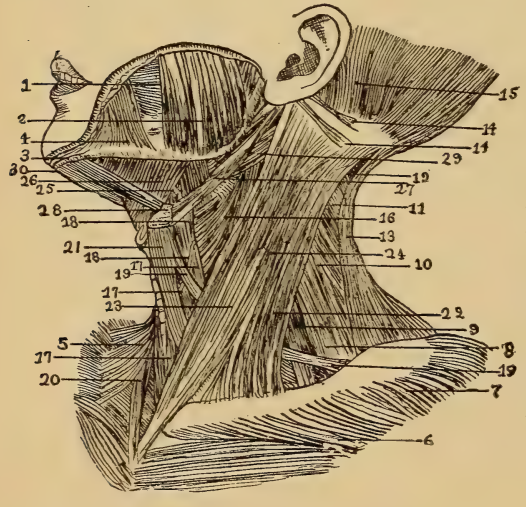


FIG. 168. MUSCLES OF THE NECK.

1, Buccinator. 2, Masseter. 3, Depressor labii inferioris. 4, Depressor anguli oris. 5, Lower part of platysma myoides. 6, Pectoralis major. 7, Deltoid. 8, Scalenus posticus. 9, Scalenus anticus. 10, Levator anguli scapulæ. 11, Splenius colli. 12, Splenius capitis. 13, Trapezius. 14, Retrahens aurem. 15, Occipital. 16, Constrictor of pharynx. 17, Sternothyroid. 18, Thyrohyoid. 19, Omohyoid. 20, Sternohyoid. 21, Left sternohyoid. 22, 23, 24, Sternocleidomastoid. 25, Hyoglossus. 26, Mylohyoid. 27, Stylohyoid. 28, Tendon and pulley for digastric. 29 and 30, Digastric.

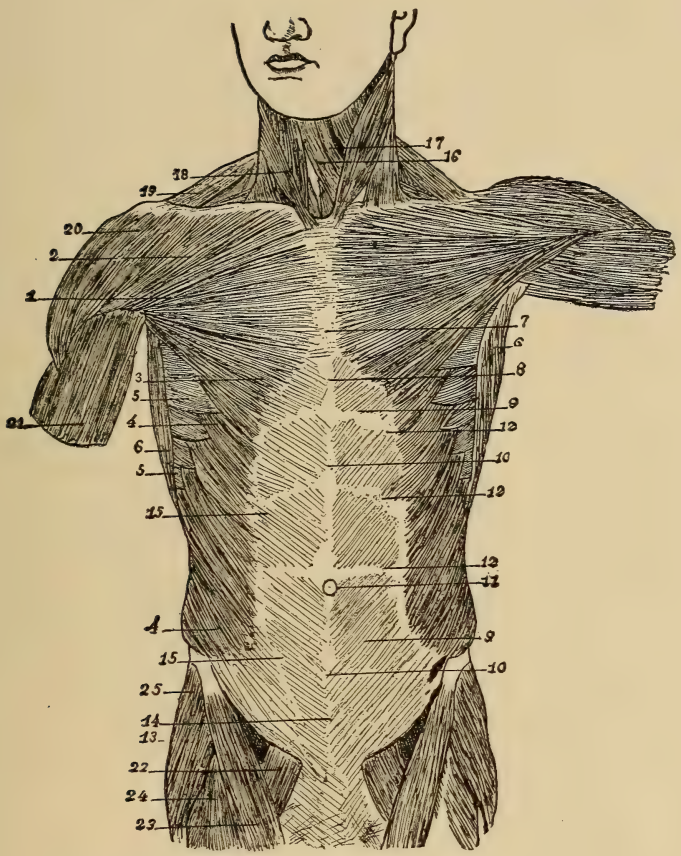


FIG. 169. MUSCLES OF THE FRONT OF THE BODY.

1. Pectoralis major. 2, Attachment of same to the clavicle. 3, Attachment of same to abdominal aponeurosis. 4, External oblique. 5, Serratus magnus. 6, Latissimus dorsi. 7, Parts of the pectorales majores. 8, Ensiform cartilage. 9, Aponeurosis. 10, Linea alba (white line). 11, Umbilicus or navel. 12, Rectus abdominis. 13, External abdominal ring. 14, Pyramidalis. 15, Rectus abdominis. 16, Sternohyoid. 17, Omohyoid. 18, Sternomastoid. 19, Trapezius. 20, Deltoid. 21, Biceps. 22, Pectineus. 23, Sartorius. 24, Rectus femoris. 25, Tensor vaginal femoris.

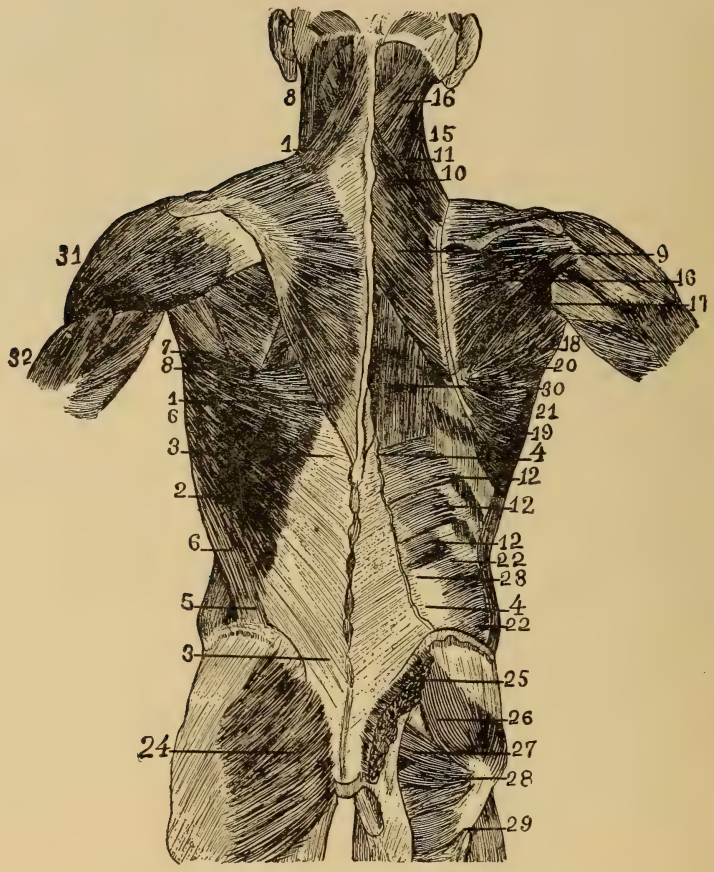


FIG. 170. MUSCLES OF THE BACK OF THE BODY.

1, Trapezius. 2, Latissimus dorsi. 3, Aponeurosis connecting muscles of the lumbosacral region. 4, Aponeurosis attaching the latissimus dorsi. 5, Attachment of the latissimus dorsi to the ilium. 6, Latissimus dorsi, external border. 7, Teres major. 8, Latissimus dorsi curving around the teres major. 9, Rhomboideus major. 10, Rhomboideus minor. 11, Serratus posticus superioris. 12, Serratus posticus inferioris. 13, Sternomastoid. 14, Splenius. 15, Levator anguli scapulæ. 16, Infraspinatus. 17, Teres minor. 18, Teres major. 19, Latissimus dorsi. 20, Attachment of same to the scapulæ. 21, Serratus magnus. 22, Internal oblique. 23, Aponeurosis of same. 24, Gluteus maximus. 25, Gluteus maximus, cut off. 26, Gluteus medius. 27, Pyramidalis. 28. Tendon of gemelli and obturator internus. 29, Quadratus femoris. 30, Longissimus dorsi. 31, Deltoid. 32, Triceps.

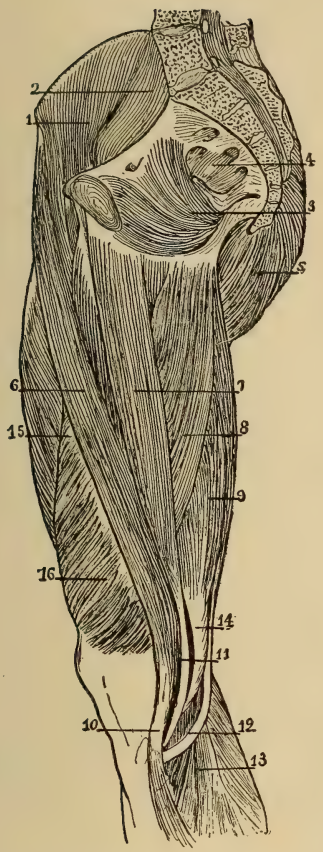


FIG. 171. MUSCLES OF INNER PART OF THE THIGH.

1, Iliacus. 2, Psoas magnus. 3, Obturator internus. 4, Pyriformis. 5, Gluteus maximus. 6, Sartorius. 7, Gracilis. 8, Semitendinosus. 9, Semimembranosus. 10, Tendon of sartorius. 11, Tendon of gracilis. 12, Tendon of semitendinosus. 13, Enlargements of same. 14, Tendon of semimembranosus. 15, Rectus femoris. 16, Vastus internus.

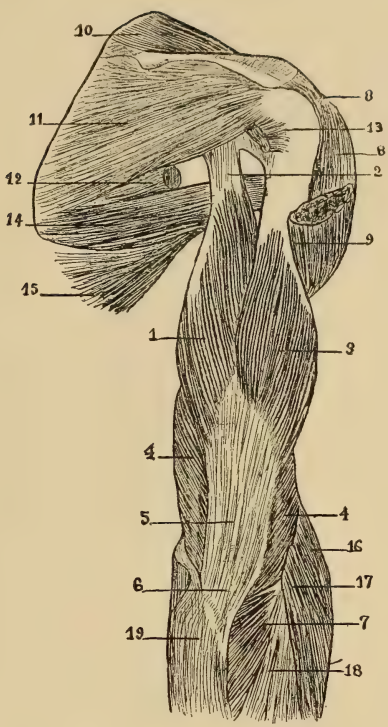


FIG. 172. BACK VIEW OF THE TRICEPS.

This muscle is so called because it has three heads, viz.: 1, The long, middle, or scapula head, attached to the scapula or shoulder blade. 3, The outer or long humeral head, attached to the humerus. 4, The short or inner humeral head, attached to the humerus. 2, Tendon of the long, middle, or scapular head. 5, Common tendon. 6, Attachment of tendon to the olecranon process on the back of the ulna. 7, Anconeus. 8. Deltoid. 9, Lower part of deltoid. 10, Supraspinatus. 11, Infraspinatus. 12, Teres minor, cut away. 13, Teres minor inserted into the humerus. 14, Teres major. 15, Latissimus dorsi. 16, Supinator longus. 17, Extensor carpi radialis longior. 18, Extensor carpi ulnaris. 19, Flexor carpi ulnaris.

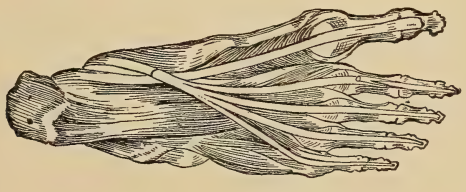


FIG. 173. SOLE OF THE FOOT.

Showing arrangement of muscles and tendons.

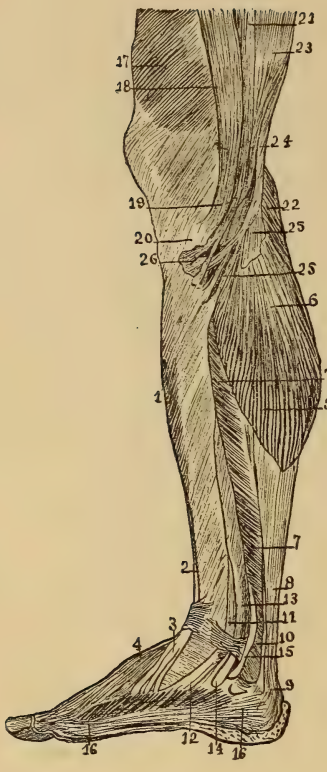


FIG. 174. MUSCLES OF THE LEG.

1, Tibialis anticus. 2 and 3, Tendon of same. 4, Tendons of extensor communis digitorum. 5, Gastrocnemius. 6, Origin of same. 7, Soleus. 8 Tendo Achillis. 9, Attachment of same to os calcis. 10, Tendon of plantaris. 11, Tendon of tibialis posticus. 12, Attachment of same to scaphoid. 13 and 14, Tendon of flexor longus digitorum. 15, Tendon of flexor longus pollicis. 16, Adductor pollicis. 17, Vastus internus. 18, Sartorius. 19, Tendon of same. 20, Same cut away. 21, Gracilis. 22, Tendon of same. 23, Tendon of semimembranosus. 24 and 25, Tendon of semitendinosus. 26, Tendon of gracilis and semitendinosus.

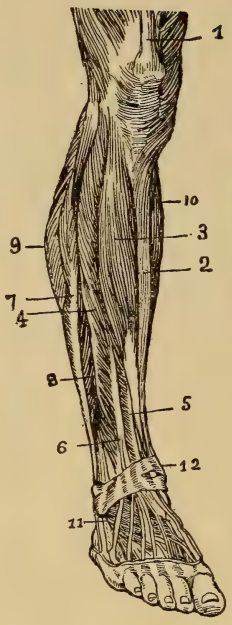


FIG. 175. MUSCLES OF THE FRONT OF THE LEG.

1, Tendon of the quadriceps extensor. 2, Extensor proprius pollicis. 3, Tibialis anticus. 4, Extensor longus digitorum. 5, Tibia. 6, Extensor proprius hallucis. 7, Peroneus longus. 8, Peroneus brevis. 9, Soleus. 10, Popliteus. 11, Extensor brevis digitorum. 12, Annular ligament.

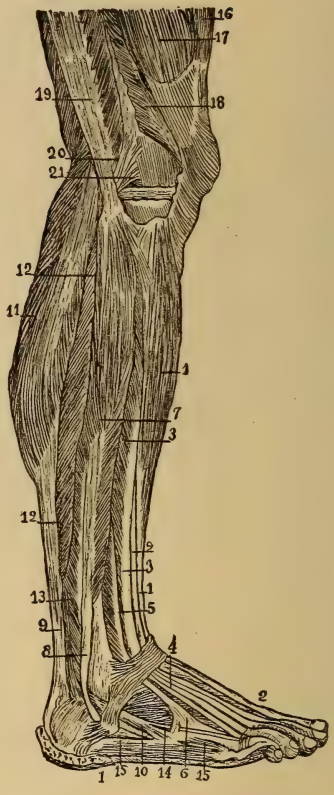


FIG. 176. MUSCLES OF THE LEG.

1, Tibialis anticus. 2, Tendon of extensor proprius pollicis. 3, Extensor longus digitorum. 4, Tendons of same. 5, Peroneus tertius. 6, Attachment of same. 7, Peroneus longus. 8, Tendon of same. 9, Peroneus brevis. 10, Tendon of same. 11, Gastrocnemius. 12, Soleus. 13, Tendo Achillis. 14, Extensor brevis digitorum. 15, Abductor minimi digiti. 16, Rectus femoris. 17, Vastus externus. 18, Lower part of same. 19, Tendon of biceps femoris. 20, Lateral ligament of knee. 21, Tendon of popliteus.

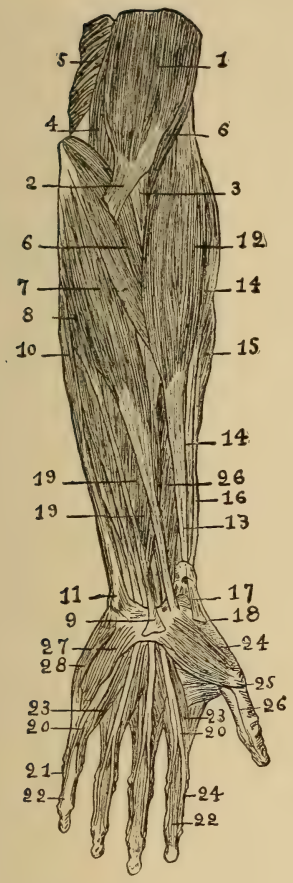


FIG. 177. OUTER LAYER OF MUSCLES OF THE FOREARM. PALM UP.

1, Biceps. 2, Fascia of the biceps. 3, Tendon which fastens the biceps to the radius. 4, Brachialis anticus. 5. Triceps. 6, Pronator radii teres. 7, Flexor carpi radialis. 8, Palmaris longus. 9, Palmar ligament. 10, Flexor carpi ulnaris. 11, Attachment of same to pisiform bone. 12, Supinator longus. 13, Attachment of same to styloid process of the radius. 14, Extensor carpi radialis longior. 15, Extensor carpi radialis brevior. 16, Extensor ossis metacarpi pollicis. 17, Attachment of same to first metacarpal bone. 18, Tendon of extensor secundi internodii pollicis. 19, Flexor sublimis digitorum. 20, Tendons of same. 21, Attachment to second phalanges of fingers. 22, Attachment of tendons of the same to the last phalanges of the fingers. 23, Lumbricales. 24, Tendon of flexor sublimis. 25, Abductor pollicis. 26, Flexor longus pollicis. 27, Flexor brevis minimi digiti. 28, Abductor minimi digiti.

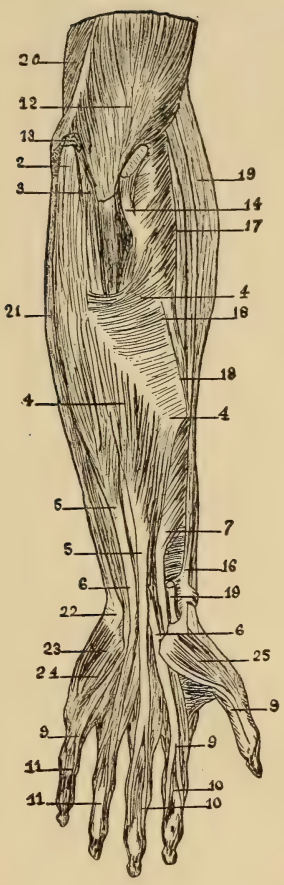


FIG. 178. MUSCLES OF THE ARM.

1, Flexor sublimis digitorum. 2, Attachment to the epitrochlea. 3, Attachment to the coronoid of the ulna. 4, Attachment to the radius. 5, Tendons of same to the middle and ring fingers. 6, Tendons of same to first and little fingers. 7, Flexor longus pollicis. 8, Tendon of same. 9, Tendons of flexor sublimis. 10, Spaces between same. 11, Tendons of flexor profundus. 12, Tendon of flexor brachialis anticus. 13, Tendon of epitrochlear muscles. 14, Tendon of biceps. 15, Supinator longus. 16, Attachment of same to styloid process of the radius. 17, Extensor carpi radialis longior. 18, Tendon of pronator radii teres cut away. 19, Tendon of extensor carpi radialis. 20, Triceps. 21, Flexor carpi ulnaris. 22, Attachment of same to pisiform bone. 23, Adductor minimi digiti. 24, Flexor brevis minimi digiti 25, Adductor brevis pollicis.

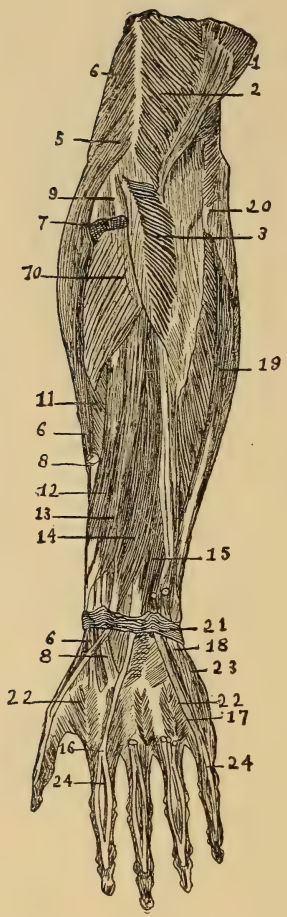


FIG. 179. DEEP LAYER OF MUSCLES OF THE FOREARM.

1, The tendon, and 2, the head of triceps. 3, Anconeus. 4, Attachment of supinator longus to the humerus. 5, Attachment of extensor carpi radialis longior to the humerus. 6, Attachment of same to second metacarpal bone. 7, Tensor carpi radialis brevior. 8, Insertion of same into third metacarpal bone. 9, Tendon of the deep and superficial muscles. 10, Supinator brevis. 11, Insertion of pronator radii teres into the radius. 12. Extensor ossis metacarpi pollicis. 13, Extensor pollicis. 14, Extensor pollicis secundi. 15, Extensor indicis. 16, Common tendon of same and of common extensor. 17, Tendon of extensor minimi digiti. 18, Tendon of extensor carpi ulnaris. 19, Flexor carpi ulnaris cut away showing flexor profundus digitorum. 20, Upper part of deep flexor. 21, Ring shaped ligament. 22, Interossei. 23, Abductor minimi digiti. 24, Tendons of extensor digitorum.

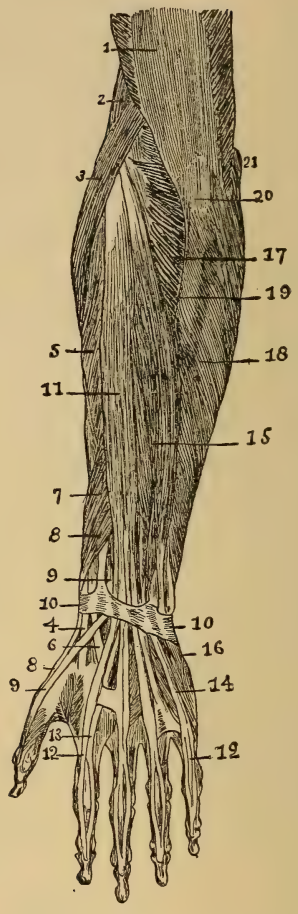


FIG. 180. MUSCLES OF FOREARM.

1, Triceps. 2, Supinator longus. 3, Extensor carpi radialis longior. 4, Attachment of same to metacarpal bone. 5, Extensor carpi radialis brevior. 6, Attachment of same to metacarpal bone. 7, Extensor ossis metacarpi pollicis. 8, Extensor primi internodii pollicis. 9, Extensor secundi internodii pollicis. 10, Ring shaped ligament. 11, Extensor communis digitorum. 12, Attachment of the four tendons of the same to the four fingers. 13, Tendon of extensor indicis. 14, Tendon of extensor minimi digiti. 15, Extensor carpi ulnaris. 16, Attachment of same to fifth metacarpus. 17, Anconeus. 18, Flexor carpi ulnaris. 19, Ulna. 20, Olecranon process. 21, Interior condyle of the humerus.

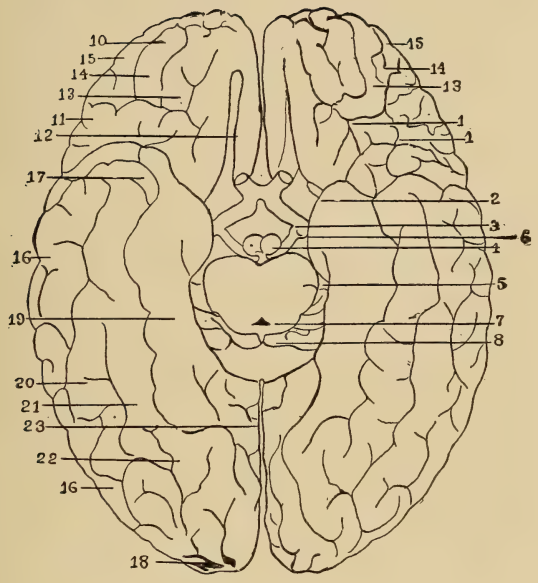


FIG. 181. BASE OF THE BRAIN.

1, Corpus callosum, the transverse fibers connecting the two hemispheres of the brain. 2, Optic chiasm, where the two nerves meet and partly cross. 3, Tuber cinereum, an elevation of gray matter on the base of the brain, and the infundibulum, a funnel-like connection of the tuber with the pituitary body. 4, Corpora albicantia, two small protuberances of white matter. 5, Pons varolii, connecting the medulla and the crura cerebri. 6, Third nerve or motor oculi, concerned in moving the eye. 7, Aqueduct of Sylvius, the canal which connects the third and fourth ventricles of the brain. 8, Testes, the posterior two of the four corpora quadrigemina composed of gray matter. 9, Omitted. 10, Frontal lobe of the brain. 11, Fissure of Sylvius. 12, Olfactory nerve, the nerve of smell. 13, 14, and 15, Convolutions of the frontal lobe, lower surface. 16, Posterior lobe of the brain. 17, Sphenoid lobe. 18, Occipital portion. 19, Hippocampus major. 20, 21, and 22. Posterior lobe. 22, Gyrus formi catus, callosgi gyrus, or gyrus of corpus callosum.

as convolutions, which are deeper and more numerous in man than in any of the animals. Such inequalities are not found upon the brain of the hare or rabbit, nor upon the brains of rodent animals. These inequalities are neither so bold nor so deep in the ox as in the horse, nor so well marked in the horse as in the dog, seeming to increase or diminish very much with the ratio of intelligence, as does also the bulk of the brain. In fishes, the brain is very small, and in the invertebrate animals it diminishes to mere nervous ganglia. It is curious to observe that while in the robin and among birds, the brain approaches to the proportionate size of that of the human being, in the goose it bears a very much smaller proportion to the bulk of the body.

The cerebral substance is composed of pulp containing both fibers and cells. One portion is termed the gray substance, on account of its color; it consists of fine cellular membrane, sustaining a complete network of small blood vessels. Larger in quantity, and firmer in consistence, is another substance, termed the white or medullary portion. It consists of minute fibers woven together like a plaited straw.

In the medulla oblongata the arrangement of the white and gray matter is substantially similar to that which obtains in the spinal cord, that is to say, the white matter is external and the gray internal. But in the *cerebellum* and *cerebral hemispheres,* the gray matter is external and the white internal; while, in the optic *thalami* and *corpora striata,* gray matter and white matter are variously intermixed.

THE NOSE.

The nose contains the organ of smell in vertebrate animals, and in the three highest classes is connected with the respiratory function. In man, the nose, anatomically considered, consists of two large cavities, called nostrils, a right and a left, formed by the bones of the face, and separated from each other by a perpendicular flat partition called the *septum.* The upper wall of the nose is pierced by numerous foramina, through which enter the filaments of the olfactory, or nerve of smell.

Besides smell, the nose has ordinary sensation, like other parts of the face, depending on filaments of the trifacial or fifth pair of cerebral nerves. The external prominent part of the nose, which gives character to the features, is composed of several cartilages connected to the bones and to each other by strong fibrous tissue, sufficiently firm to preserve the shape of the organ, and so elastic and flexible as to permit the expansion and contraction of the nostrils in respiration. The nose contains not

only the nerves of smell, but serves also for the passage of air into the lungs, and has a considerable influence upon the voice. The sense of smell resides in the mucous membrane that lines the upper portions of the cavity of the nose. The olfactory nerves arise from the under sides of the olfactory lobes and pass out through the roof of the nose. Their function is to carry to the brain the special sensation of smell. A very minute amount of any substance is required to affect the sense of smell. A grain of musk will perfume a room for a long time without losing appreciable weight. In order to appreciate odors, we must draw the odorous air through the nose; hence the act of *sniffing*. If the air in the nasal passages remains stationary, we cannot smell. The uses of the sense of smell are to detect improper food and impurities of the air.

THE THROAT.

The Pharynx (throat cavity) into which the mouth, nose, gullet (œsophagus), and the windpipe open, is lined by mucous membrane and has muscles in its walls which, by their contraction, drive the food on to the œsophagus.

The Trachea (windpipe) is the cartilaginous and membranous canal through which the air passes into the lungs. It leads downwards along the front part of the throat, where it may be readily felt. Its walls are strengthened by a series of cartilaginous hoops which are incomplete behind, their ends being united only by muscle and membrane. This arrangement enables the trachea and its branches to be kept open. The trachea is about four and one-half inches long by one inch wide. After passing through the thorax, it divides into two branches (bronchi), a right and a left. Each bronchus enters the lung of its own side, and then breaks up into a great number of smaller branches which are called *bronchial tubes.*

The top of the windpipe is called the **larynx** (organ of voice). This is a triangular-shaped box of cartilage whose lower end opens freely into the trachea. Its upper end is closed by muscles and membranous tissues except an opening (the glottis) which is protected by a plate of cartilage known as the *epiglottis*. The epiglottis may be seen if the mouth is opened widely and the back of the tongue pressed down by the handle of a spoon. During swallowing it is pressed down like a lid over the opening of the air tube and helps to keep food from entering it.

The larynx is composed of cartilages connected together by ligaments, moved by numerous muscles, is lined by the mucous membrane, and supplied with vessels and nerves. The cartilages of the larynx are

nine in number, three single and three in pairs. The vocal ligaments (cords) are two narrow bands of dense, fibrous, and highly elastic tissue, stretched between the anterior angle of the thyroid and the anterior surface of the arytenoid cartilages. They lie in the pharynx so that only a narrow slit (the glottis) is left between them. As the air is driven through the glottis these cords vibrate and give rise to sounds. The longer the vocal cords are, the lower is the pitch of the voice. Children have shrill voices because the larynx is small, and for this reason a woman's voice is usually higher pitched than a man's. About sixteen or seventeen years of age, a boy's larynx grows very fast and his voice becomes an octave deeper in tone.

The Oesophagus is a muscular tube about nine inches long, through which food is conveyed from the throat to the stomach. It commences at the lower termination of the pharynx and, passing on through the neck and chest, ends below the diaphragm, by opening at the cardiac orifice of the stomach. In the neck, it lies close behind the windpipe. Its direction is nearly straight, having only two or three slight curvatures. It consists of three coats: a mucous membrane within; next, a submucous membrane coat of areolar muscular tissue; and, outside, a muscular coat made up of two layers.

The Mouth Cavity is bounded in front and on the sides by the lips and cheeks, below by the tongue, and above by the palate, which consists of two parts; viz., the *hard palate* and the *soft palate.* The *hard palate* is in the anterior part, is supported by bone, and forms the partition between the mouth and the nose. The *soft palate* is in the posterior part and is unsupported by bone. It arches down at the back of the mouth and hangs like a curtain between it and the pharynx. The *uvula* is the pendent, fleshy lobe in the middle portion of the soft palate.

The cavity at the back of the mouth, from which the larynx and pharynx proceed, is known as the **fauces,** while the sides of the soft palate skirting the sides of the passage, or *fauces,* form double muscular pillars, which are termed the *pillars of the fauces.* Between these, the *tonsils* are situated, one on each side. The tonsils are round or oval shaped glands. In their natural state, they can be discerned easily as they project slightly on each side of the fauces; but, when swollen and inflamed, as they often are in weakly and scrofulous persons, they are very noticeable, being bright red, and often hanging down so as to nearly fill the throat, thus rendering swallowing very difficult. The tonsils sometimes become enlarged during a cold or sore throat. Occasionally the enlargement is permanent and causes much annoyance. The treat-

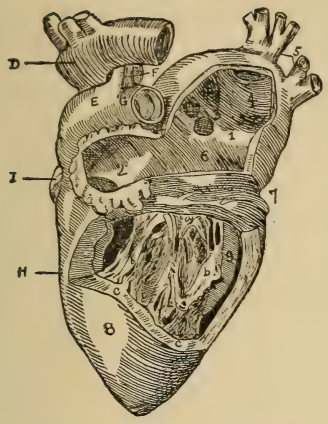


FIG. 182. LEFT SIDE OF HEART.

1, Left auricle. 2, Appendix of the auricle. 3, Openings of the pulmonary veins. 4, Pulmonary sinus into which the pulmonary veins empty. 5, Pulmonary veins. 6, Opening from the auricle into the ventricle. 7, Coronary vein. 8, Left ventricle. 9, Hollow of the left ventricle. a, Mitral valve. b, and c, Columnæ carneæ. D, Arch of the aorta. E, Pulmonary artery. F, Ductus arteriosus, which in the fœtus connects the descending aorta and the pulmonary artery. G, Left pulmonary artery. H, Right ventricle. I, Appendix of right auricle.

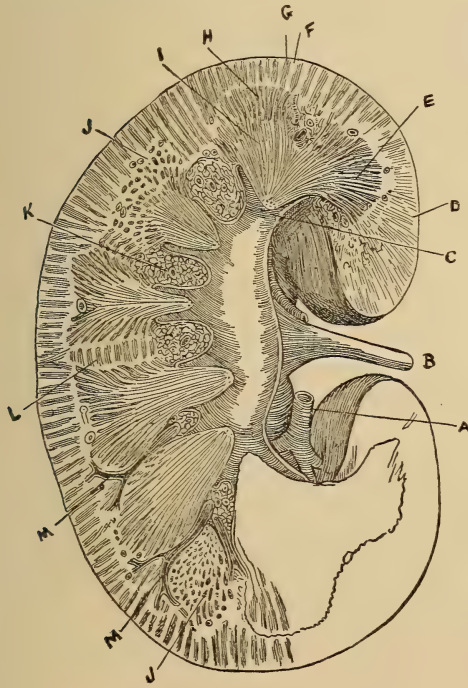


FIG. 184. SECTION THROUGH THE KIDNEY.

A, Renal artery. B, Ureter. C, Renal calyx. D, Cortex. E, Medulla. F, Medullary rays. G, Labyrinth. H, Boundary layer of medulla. I, Papillary portion of medulla. J, Cross sections of tubules. K, Fat cells in renal sinuses. L, Medullary rays running crosswise. M, Artery.

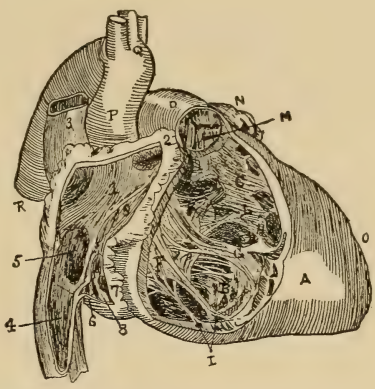


FIG. 183. RIGHT SIDE OF THE HEART.

1, Right auricle. 2, Appendix of the right auricle. A, Muscular pouch projecting from the inner surface of the auricle and overlapping the root of the pulmonary artery. 3, Superior vena cava, formed by the union of the right and left innominate veins and the azygos veins. 4, Inferior vena cava, formed by the union of the right and left common iliac veins. 5, Fossa ovalis, a depression in the right auricle, the connection of the right and left auricles. 6, Eustachian valve, separating the inferior vena cava from the auriculo-ventricular opening. 7, Coronary vein, which returns blood from the substance of the heart to the right auricle. 8, Coronary valve, closing the coronary sinus. 9, Opening of canal connecting the auricle and ventricle. A, Right ventricle. B and C, Cavity of right ventricle. E and F, Tricuspid valve, which prevents the blood from being forced from the right auricle into the right ventricle. G, H, I, K, and L, The chordæ columnæ, or muscles by which the tricuspid and mitral valves are connected to the walls of the ventricle. M, Pulmonary artery valve. N, Top of left auricular appendix. O, Left ventricle. P, Ascending aorta. Q Arch of the aorta. R. Descending aorta.

ment usually adopted in such cases is to remove them, which can be done by a competent surgeon without danger.

THE HEART.

The heart is the great central organ of circulation. Its form is that of a cone having its base directed backward towards the spine and its apex forward and downward towards the left side, so that with each beat it may be felt striking between the fifth and sixth ribs, about four inches to left of the median line. In its natural position it rests upon the diaphragm, having the surface on which it lies somewhat flattened. It is inclosed in a moist membranous sack called the pericardium, which allows it a free motion without friction. Behind and above, the pericardium is also loosely attached to the upper and back part of the chest.

The heart may be described as a hollow muscle, having four cavities, two on each side. Its action is that of a double pump, intended to carry on the circulation through the body and through the lungs; the auricle and ventricle on the left side being devoted to the former, and those of the right side to the latter. Each auricle is connected with its corresponding ventricle by an opening guarded by a valve which opens for the blood to pass in the right direction, any attempt to return being instantly resisted by the closing of the valves. Should these become disabled so that they perform their office imperfectly, there will be regurgitation, or return of the blood, which occasions serious derangement of the circulation, resulting in organic disease. These valves are double folds of the serous membrane and are stiffened somewhat by a few fibers which run between the folds. All have three flaps except the one between the left auricle and left ventricle, which has only two. *Papillary muscles* (chordæ tendineæ) keep the valve flaps shut across the openings and maintain their edges in contact. The walls of the ventricles are thicker and more muscular than those of the auricles because they pump the blood through the blood vessels. The left ventricle is stouter than the right; it has to force the blood over most of the body while the right sends it over the pulmonary circuit, which is comparatively short.

The circulation is also spoken of as consisting of two general divisions: the *pulmonary,* which carries the blood to, through, and from the lungs; the *systemic,* which guides its flow through all the remaining organs. The flow from the stomach and intestines through the liver to the inferior vena cava is known as the *portal circulation.*

The contraction of any part of the heart, especially that of the ven-

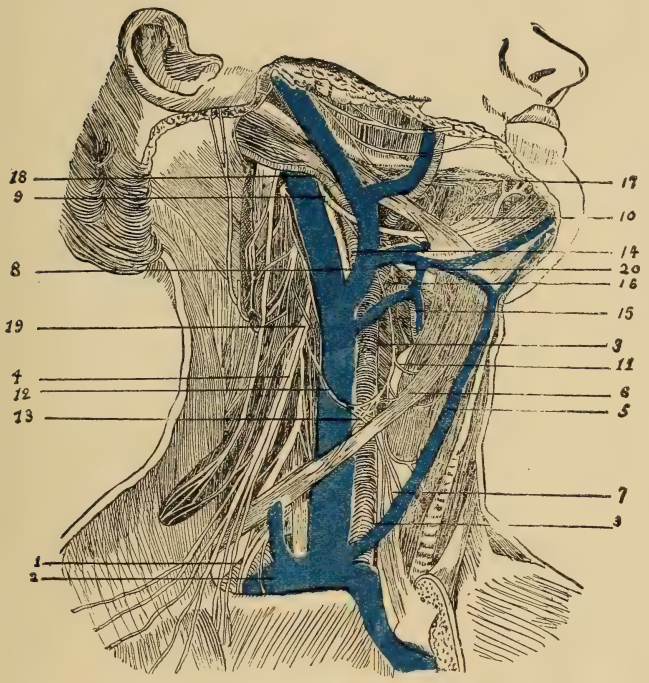


FIG. 185. VESSELS AND NERVES OF THE NECK.

1, Subclavian artery. 2, Subclavian veins. 3, Common carotid artery. 4, Internal jugular vein. 5, Anterior jugular vein. 6, Omohyoid muscle. 7, Sternohyoid muscle. 8, Pneumogastric nerve. 9, Hypoglossal nerve. 10, End of hypoglossal nerve. 11, Descending branch of same. 12, Internal branch of cervical plexus. 13, Plexus formed by descending branch of hypoglossal and internal branch of cervical. 14, External carotid artery. 15, Superior thyroid artery and vein. 16, Lingual and facial arteries. 17, Facial artery and vein. 18, Occipital artery. 19, Branches of first four cervical nerves. 20, Superior laryngeal nerve.

tricle to force out the blood, is called the *systole;* the relaxation, its *diastole.* The *cardiac period* is the time from pause to pause.

The heart not only by its contraction propels the blood, but by its expansion it produces suction to draw it up, so that it is at once both a suction and a force pump; and such is the power of its action that the whole mass of the circulation, about twenty-eight pounds, goes through the system in the space of two minutes.

The contraction on both sides of the heart is simultaneous, commencing at the mouths of the veins which open into the auricles. It runs over the auricles and is immediately taken up by the ventricles. The auricles relax the moment the ventricles start to contract. The ventricles begin to dilate after ceasing to contract. Then, for a short time, neither the auricles nor ventricles contract, but the whole heart expands. These contractions and relaxations average about seventy per minute in the adult. The rapidity may vary owing to sudden emotions.

The sounds of the heart are caused by its alternate contractions and relaxations and are known as the *first* and *second sounds* of the heart. The first is a prolonged, rumbling sound, and the second short and sharp. The former is probably due to the vibrations of the tense valve flaps and the ventricular wall; the second, to the closure of the semilunar valves.

The nerves of the heart receive nervous impulses from the nerve centers and cause the contraction of the muscle fibers of the wall of the heart, thus producing its *beating.*

The heart muscle gets its rest during the pause between contractions, thus doing active work during eight hours of the twenty-four. In fevers, the heart has less time to rest owing to its more rapid beating, and becomes exhausted by overwork.

THE ARTERIES.

The Arteries are vessels which convey the blood from the heart; they were formerly supposed to contain air only, from their being found empty after death. They convey the blood, after it has received a supply of oxygen from the lungs, wheresoever it is required for the purpose of life. These arteries are membranous, cylindrical tubes composed of three coats and have rings of muscular tissue in their walls which contract and relax. They are highly elastic and extensible, being capable of bearing a great amount of strain and pressure to which they are occasionally subjected but which sometimes results in a rupture. Except the pulmonary artery and the aorta, which have semilunar valves at their origin, arteries have no valves. All the arteries of the *systemic*

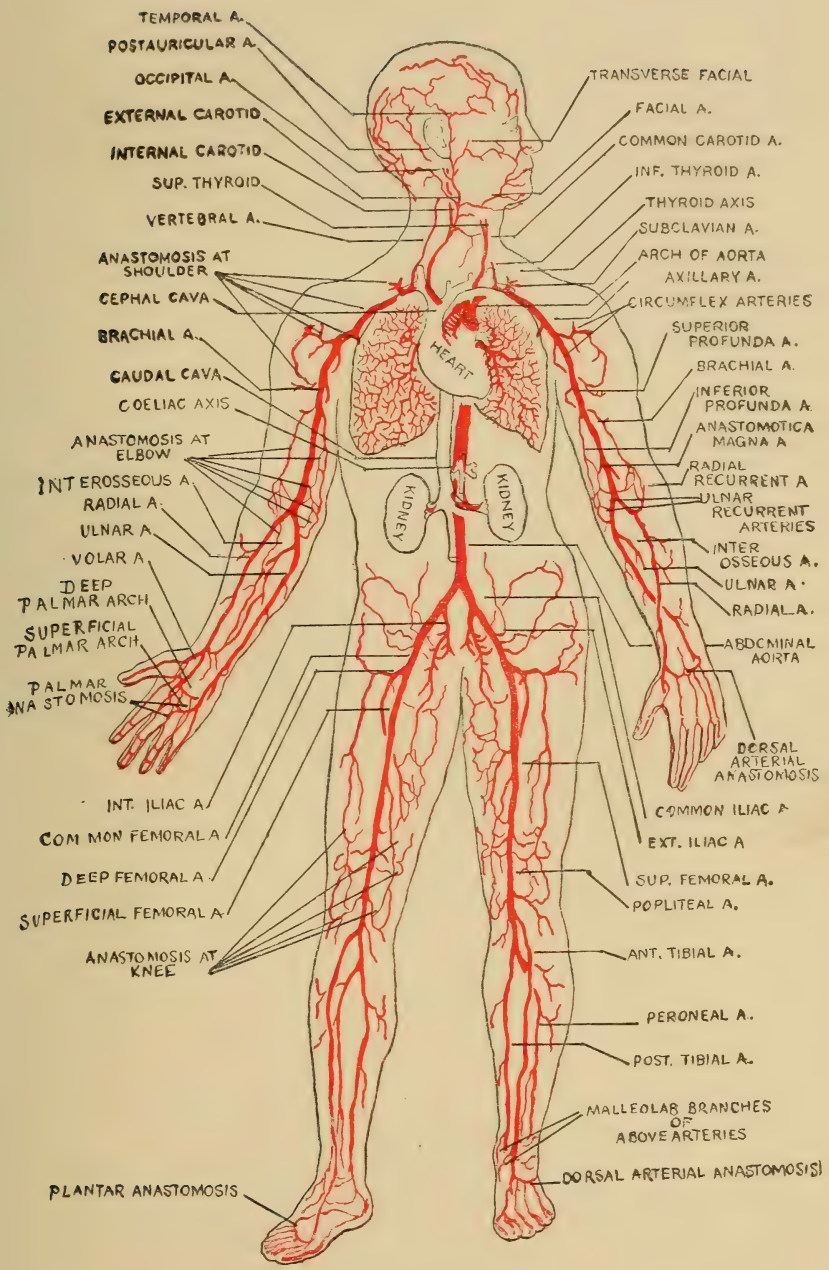


FIG. 186. ARTERIAL SYSTEM.

circulation proceed from the *aorta*. This main trunk or channel proceeds from the left ventricle of the heart and contains the pure arterial blood, known by its bright red color and issuing, when it makes its escape at any accidental opening, in jets, in accordance with the pulsations.

The large arteries usually lie deep for protection; the heart pumps blood into them with great force and, when an artery is cut, rapid and dangerous bleeding occurs. However, some come very near to the surface.

Arterial blood is rich in oxygen and poor in carbon dioxide. Its coloring matter, hæmoglobin, forms a scarlet compound with oxygen. The blood flows though the arteries with an average velocity of twelve inches per second. The arteries have rings of plain, muscular fiber in their walls. When they contract, the artery is narrowed, and when they relax it is widened under the pressure of blood from the heart, thus carrying more blood to the capillaries of the organ which it supplies. These muscles regulate the flow of blood so that parts hard at work may receive a sufficient supply; and parts at rest, just sufficient to keep them nourished. The main arteries are the *aorta*, the large artery which first receives the blood from the left ventricle of the heart; the *femoral* arteries, the main arteries of the thighs; *brachial*, of the upper arm; *radial*, of the thumb sides, and *ulnar*, of the little finger sides of the forearms; the *carotid*, which supply the front of the head and face, the *pulmonary*, which divides into two branches, one going to the right lung and one to the left lung.

THE VEINS.

Veins are the channels by which the blood is returned to the heart and lungs to be purified. The arteries and veins do not communicate directly with each other, but are connected by capillaries. The smallest veins arise from the capillary network and unite to form larger and larger trunks. In structure the veins are similar to the arteries, but they are thinner and, when emptied of their food, they are flattened and collapsed. Most veins contain many valves, formed by pouches of their lining and resembling the semilunar valves; these valves are composed of a thin stratum of nucleated areolar tissue mingled with fine, elastic fibers, and coated on the two surfaces with fine, elongated cells. The segments or flaps of these valves are semilunar in form and arranged in pairs, one on either side of the vessel generally, but sometimes there is a single flap which has a spiral direction, and, occasionally, there are three. The free border of the valvular flaps is concave

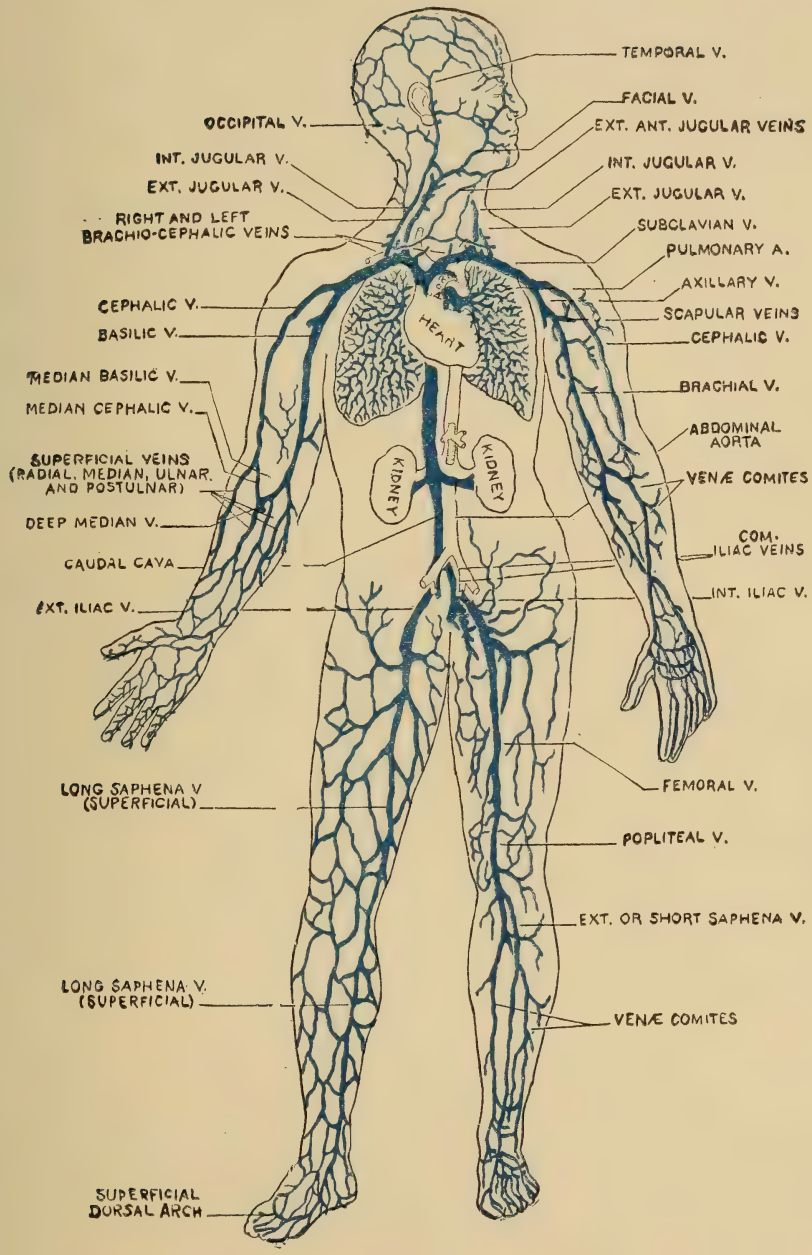


FIG. 187. VENOUS SYSTEM.

and directly forwards, so that while the current of blood is permitted to flow freely towards the heart, the valves are distended and the current intercepted, if the stream from fullness of the veins above or other causes should turn back. When we consider that the course of the venous current is upward, and so opposed to the law of gravitation, we shall see at once the wisdom of such an arrangement. In the veins of the extremities, particularly the deeper ones, they are most numerous; in the portal and cerebral, and very small veins, and those of the viscera, they are generally absent, and altogether so in the large trunks.

The veins are nearer the surface than the arteries, each of which is usually accompanied by one or two veins; the largest by one and the smaller by two. The *jugular* veins are the companions of the carotid arteries and run close to their sides. These are an exception to the rule that veins take their names from the corresponding arteries. The venæ cavæ are the large veins which collect blood from the smaller ones and discharge it into the heart through the right auricle. The Latin word means, hollow veins. *Venous blood* is dark purple because of the excess of the darker colored hæmoglobin, the oxygen having been used in the capillaries; but there is one exception. The *pulmonary vein* carries scarlet blood; the *pulmonary artery,* black blood. This artery divides into two branches; one going to the right lung and one to the left lung. There are two corresponding veins, one from each lung. The blood flows through the veins, eight inches per second. The aggregate area of the veins is much smaller than that of the capillaries, but greater than that of the arteries. There is no pulse in the veins, as they receive the even capillary flow of blood. Thus the danger of their rupture is diminished. Their walls have to be very thin, that the blood may ooze through them to nourish the organs of the body, and that wastes from the organs may get to the blood to be carried off. If the blood were sent into them in sudden jets, they would be in danger of being torn.

THE CAPILLARIES.

The connection between the veins and the arteries is through the *capillaries.* They vary in diameter from 1-2000 to 1-1500 of an inch and are so small that only one or two blood corpuscles can pass through them abreast. They are formed of a single layer of flat cells and are really a continuation of the lining membrane of the arteries, veins, and heart; it is through this medium that all the phenomena of nutrition and secretion are performed. They are all small alike and are joined on the one hand with the terminal ramifications of the arteries, and on the other

with the minute radicles of the veins. They have but one coat, which is transparent and fiberless; as they approach the arteries and veins, this becomes thicker. The capillaries are most abundant in the lungs, liver, kidneys, and other secreting glands, also in the skin and mucous membrane. They are smallest and least abundant in the muscles, nerves, organs of sense, and those tissues where nutrition only is accomplished. They are large in the bones, but not numerous.

Their function is to allow the blood to pass from the arteries to the veins and do its nutritive work. The liquid containing nourishment exudes from the blood through the thin walls to bathe the tissues. Their united area is many times greater than that of the arteries supplying them. The same quantity of blood flowing through them has a wider channel to flow in, the velocity being only one-thirtieth of an inch per second. Like the veins, they have no pulse and, hence, the danger of rupture is diminished.

THE BLOOD.

Blood is a thick, opaque fluid, varying in color from a bright scarlet to a dark purple. It has a somewhat viscid feel, a faint odor peculiar to itself, and a saltish taste. It contains two kinds of corpuscles, red and white. The *red corpuscles,* which give the blood a red color, are circular disks, slightly hollowed out on each face; their chief constituents being water, hæmoglobin, salts of phosphorus, and potassium. They are so tiny and numerous that about five millions of them are found in a small drop of blood. Each appears pale yellow when seen alone under the microscope; they look red only when they are crowded together in a mass. They are developed in the red marrow of the bones, thrown into the blood current, and are destroyed by the liver. The red corpuscles of most mammalia resemble those of man in being circular, biconcave, pale-yellow disks; those of birds, reptiles, amphibians, and fishes are oval and contain a nucleus in the center such as is not found in man. Each of the *white, or colorless corpuscles,* is a cell with a nucleus. They are a little larger than the red, but very much less numerous—about 1 to 300. They have the power of changing their shapes; of taking into their substance and digesting broken down cells and bacteria; of passing through the walls of the capillaries, and moving about through the tissues of the body, devouring material of different kinds. The destruction, by the white blood corpuscles, of disease-producing bacteria which enter through the lungs or mouth is known as *phagocytosis.* Some argue that the white blood corpuscles enable the body to resist many kinds of

infection (invasion by bacteria) in proportion to the vigor of the corpuscles, but sometimes the bacteria destroy the corpuscles. In these struggles the corpuscles sometimes collect in great numbers, filling up the tissues and even clogging the circulation of the blood, so as to shut off food from themselves and the tissues and contributing to their own destruction. White blood corpuscles are found in great numbers in *pus,* the discharge from abscesses. The fluid portion of the blood in which corpuscles float is called the *plasma* and is nine-tenths water. Its most important ingredients are *albumen* and *fibrin;* it also contains compounds of lime, soda, magnesia, etc. When drawn from the body, the blood becomes thickened and curd-like, not by evaporation, but by some kind of chemical reaction; this process is known as *coagulation.* The mass which separates from the rest of the blood (serum) is the *clot.* Coagulation is due to the action of a ferment, *fibrin ferment,* upon one of the proteid substances dissolved in the plasma, *fibrinogen;* its essential point is the formation of fibrin in the plasma. The *serum* is the fluid that remains after the clot has been separated from the blood. It is a pale-yellow fluid and has no fibrin. The blood, while circulating in a healthy body, does not clot, because it contains no solid fibrin, but this forms in it when the blood gets outside of the body. Coagulation stops the bleeding in wounds and closes arteries which have been tied, the ligatures crushing or tearing their delicate surface and causing the blood to clot. *Oxygen* and *carbon dioxide* are the two chief blood gases. The blood coming from the lungs is richer in oxygen and poorer in carbon dioxide; in the lungs, the plasma loses its carbon dioxide, which is diffused into the air contained in the air cells, while the oxygen of this air is diffused into the blood and is taken up by the hæmoglobin of the red corpuscles. The blood returning to the lungs is richer in carbon dioxide and poorer in oxygen because the carbon dioxide pushes its way from the tissues into the blood, while the oxygen of the blood enters the tissues to be used by them. The total amount of blood in the human body is from one-thirteenth to one-twelfth of the weight of the body.

Anæmia is a diseased condition of the blood characterized by pallor. It is due to a deficiency of red corpuscles and is accompanied by languor and listlessness. Fresh air and good food are the proper remedies.

THE AIR PASSAGES.

The Thorax or chest is the part of the trunk situated above the diaphragm. It is formed by vertebræ behind, the breastbone in front, and ribs and cartilages on the sides. The whole is covered air tight by

the skin, outside, and the pleuræ, inside. It can be expanded towards the front and sides and downward.

Air Passages.—These consist of the nose, mouth, pharynx, larynx, trachea, bronchi, bronchial tubes, and cilia—the tubes and air passages being lined with mucous membrane. The last and smallest of the bronchial tubes open into subdivided, elastic air sacs, which are known as *alveoli,* or *pulmonary lobules.* These are relatively very large, and their surface is still further increased by pouches which project from them. The blood circulates in a network of capillary blood vessels in such a way that it is brought into immediate connection with the atmospheric air drawn in by each inspiration and obtains from it a supply of oxygen and gives up carbon dioxide. Other gases which the air contains make their way through the extremely thin membrane of the air cells, and thus noxious, as well as healthful, vapors, or gases, are liable to be introduced into the circulation, and persons are sometimes poisoned by breathing, as well as by eating and drinking, deleterious substances.

It is estimated that the walls of the air cells, spread out flat and placed side by side, would cover an area of 2,600 square feet. Oxygen is received and carbon dioxide given off over the great surface. This explains the rapidity with which the exchange takes place.

Cilia are hair-like projections on the free extremities of certain epithelial cells of the air passages. They are in constant motion and sweep on the secretion of the mucous membrane, in which they are found, to the larynx, where it is coughed up.

THE LUNGS.

The Lungs are two in number and consist of bronchial tubes, air sacs, blood vessels, lymphatics, and nerves, all bound firmly together by elastic tissue. They are situated in the thorax, or chest, and, with the heart and larger blood vessels, nearly fill up the chest cavity, so that when its walls are compressed, the air is forced out of the minute air cells of the lungs into the several elastic tubes (the bronchi) connected with them. These bronchial passages afterwards unite and form one tube, the trachea, or windpipe, through which the air passes upwards and downwards in the act of respiration. The left division of the lungs is smaller than the right because the heart, which lies between the two divisions, occupies more room on that side than on the other.

If we examine the structure of the lungs, we find it porous like a sponge. When, by action of certain muscles, the capacity of the chest is increased, the air rushes in to fill the vacuum and expansion of the

lungs takes place; then the muscular movement ceases, the ribs, by their weight and elasticity, contract and force out the air, and this alternate contraction and expansion constitutes breathing, in the act of which we may see the chest rise and fall. The tubes, air cells, and blood vessels of the lungs are held together by what is called cellular tissue. The lungs are enveloped in a membrane which covers their surface, and also the surface of the chest walls, for which latter purpose it is reflected back. This membrane is called the *pleura.* Its function is to render the movements of the lungs painless and easy. *Pleurisy* is inflammation of the pleura.

The average weight of the lungs in a healthy condition is about forty ounces. They are of a conical shape, and internally concave to give a place for the heart, and externally convex, to suit the cavity of the chest. In their narrow part upward they extend a little above the first rib, their broad and slightly concave bases resting upon the diaphragm and extending farther down behind than before. They hang free in the chest, except where they are attached to the roots, which consist of the pulmonary arteries, veins, the bronchial tubes, and other tissue. In small children, they are of a beautiful pinkish color; in older persons, they are slate-colored and have black spots scattered here and there over their surface.

The lungs of an infant before birth are of dark red, and contracted into a small space within the cavity of the chest. They are firm and specifically heavier than water, in which, therefore, they sink, whether entire or cut into pieces. They also give out little or no blood and no air bubbles arise from them. This, therefore, is considered a good test as to whether a newly born infant, found dead under suspicious circumstances, was born dead or alive. If it has ever breathed, the lungs will be expanded with air and float on water; they will be of a pale red color, have a loose, spongy texture, fill the cavity of the chest, and cover the heart.

Many of the diseases to which the lungs are liable are, in their first stages, of an inflammatory character, and it is important to ascertain, as soon as they are attacked, in which of the various tissues the mischief resides. The condition of the lungs can generally be ascertained with tolerable certainty by means of auscultation; the passage of the air into and through them gives rise to certain definite sounds well understood by the practised ear, when applied to the outside of the chest, either with or without a stethoscope. In pneumonia, portions of the lungs are solidified so that air penetrates the cells with difficulty, and

in pleurisy the lungs may be surrounded with fluid. In either case, percussion gives a dull, heavy sound.

The action of the lungs may be increased by an exercise of the will. From fifteen to twenty-two is the average number of respirations in a minute, under ordinary circumstances; but this number may be very greatly increased by excitement, exercise, or disease.

The Amount of Work Done by the Lungs.—From 350 to 400 cubic feet of air are passed through the lungs of an adult man, taking little or no exercise, every twenty-four hours, and are charged with carbonic acid and deprived of oxygen, to the extent of nearly five per cent. This amounts to about eighteen cubic feet of the one gas taken in, and of the other taken out. The quantity of carbon eliminated in the twenty-four hours is fairly represented by a piece of pure charcoal weighing eight ounces. The quantity of water given off from the lungs in twenty-four hours varies very much, but averages nearly a half pint, or about nine ounces.

The Diaphragm is a muscular partition that separates the thorax above from the abdomen below. It has a strong, flat, tendinous center, from which striped muscular fibers radiate downward and outward in all directions, and are fixed by their outer ends to the six lower ribs, the breastbone, and the vertebral column. The center rises high in the chest, giving it the shape of a vaulted roof, on top of which are the lungs and heart, and, underneath, the stomach and liver. In *abdominal* respiration, the diaphragm is used freely; in *costal* or *chest breathing*, the ribs. The mechanism of respiration is somewhat different in the two sexes. In men, the diaphragm takes the larger share in the process, the upper ribs moving comparatively little; in women, the reverse is the case, the respiratory act being more largely the result of the movement of the ribs.

THE NERVES.

The Nerves are the fibers and ganglia of the brain and spinal marrow, which are distributed to every part of the body. There are two kinds of nerve substance: one white in appearance and presenting, under the miscroscope, a fibrous structure of extremely delicate threads about 1-2000 of an inch in diameter; the other is of a gray color and consists of cells filled with granular matter. These have no medullary sheaths like the white, but consist merely of an axis cylinder and primitive sheath; they are but sparingly distributed in proportion to the white, and appear to form the apparatus by which the nervous force or energy is

generated, while impressions are conveyed through the white fibers to the points of action. We may briefly state, concerning these two kinds of nerves, that one gives rise to feeling and the other to motion.

The Nervous System is the means whereby the collection of different organs in the human body may be made to work properly. By the *harmonious operation* of these organs, each organ not only looks after itself but also adapts its actions to the needs or dangers of the others: for instance, the eyelids involuntarily close when an object threatens to touch the eye. The bringing of several different things into such relations with one another, so that they perform their functions in harmony, is known as *coördination.*

Nerves are undoubtedly the organs of sensation and motion of every kind, and through them the mind operates upon the body. The intelligent mind, whose seat is the brain, *wills* that a certain action shall be performed, and instantly through the spinal cord the message flies, branching off here and there, according to the direction in which the work is to be done, and setting in motion the muscles which perform it.

The spine contains the great channel of nervous energy and it is the principal support of the bony frame. Like the veins and arteries, the nerve fibers and cells spring from great main channels, which may be compared to the stem and arms of a tree, and branch out from thence in every direction, dividing and subdividing into the most minute ramifications, so that you cannot so much as prick any part of the surface of the body but pain is felt, a sure evidence that a nerve has been touched. The nerves take cognizance of the slightest sound, the faintest ray of light, the least change in the constitution of the air we breathe; they are vigilant sentinals, ever watching to guard the body from danger, the constant ministers to its pleasure and delight. They are often abused and their sensibilities perverted or deadened, when they become subject to disease and are likely, by a long train of suffering, to avenge the injury done them.

NUTRITION.

The organs of nutrition are generally classed as *receptive* and *excretory.* Receptive organs gather new material from the outside for the use of the body, and are divided into two sets; the first, represented by the alimentary canal, receive oxidizable things and take in food and drink; the second set consists of the lungs with the air passages leading to them and, as receptive organs, they absorb oxygen. Excretory organs get rid of the waste material formed in the body. The most

important are the *lungs,* which give out *carbon dioxide gas* and *water;* the *kidneys,* which get rid of *urea* and *water;* the *skin,* which gives out *water,* common *salt,* and a minute quantity of *urea.*

The digestive organs make solvent juices and pour them upon the food which is swallowed, in order to get it into a liquid state which will permit it to soak through the walls of the stomach and intestines. By means of the blood vessels much of the dissolved food passes into the blood vessels of the alimentary canal and is carried to every organ. The lymphatics take up some of the dissolved food and carry it into the blood vessels. By means of the respiratory organs, oxygen is conveyed to the lungs, where it is picked up by the blood, in its circulation, and carried to every part of the body. *Assimilation* means the building and repairing of tissues and organs from the dissolved food obtained from the blood and from oxygen conveyed to it. These ooze through the walls of the blood vessels and are taken up by the living tissues and built into new tissues like themselves, to replace the parts that have been used up and destroyed. *Disassimilation,* the converse process of assimilation, which accompanies all vital action, is the breaking down into wastes of a living tissue when it works. The wastes of each working tissue pass into the lymphatics, which are found not only in the walls of the alimentary canal but all over the body, and are carried by them into the blood vessels. These in turn convey the wastes to the lungs, kidneys, and skin, which get rid of them. *Oxidation* is the union of oxygen with other substances. The body is kept warm by oxidation; when materials are oxidized in the body, some of the energy set free appears as heat.

THE STOMACH.

The Stomach is a curved, conical, elastic bag, with muscular cells composed of smooth, muscular fibers and lined by an epithelium. Through the œsophagus it receives masticated food, which is further acted upon by the gastric juice and converted into *chyme.* It is situated in the left hypochondriac and epigastric region, and, when distended, it has the shape of an irregular cone, having a rounded base and being curved upon itself. The left extremity is the larger and because it is on the heart side of the body it is called *cardiac dilation.* The œsophagus opens into the stomach near the middle of the whole length of the organ by the *cardiac orifice;* while, by the *pyloric orifice* at the other end, the digested matter enters the small intestine.

When moderately distended, it is almost twelve inches long, four inches across its widest parts, and contains about three pints. The stomach has four coats named successively, from without in, as the serous, the muscular, the submucous, and the mucous. The *serous coat* is a thin, smooth, transparent, elastic membrane formed by a reflection of the peritoneum. The *muscular coat* is very thick, and consists of unstriped muscular tissue arranged in three layers—longitudinal, circular, and oblique. The *submucous coat* is made up of lax areolar tissue and binds loosely the mucous coat to the muscular. The *mucous coat,* lining the wall of the stomach, is a moist, inelastic membrane, and has multitudes of small glands which open on its surface. These glands throw out a thin acid fluid, the *gastric juice,* when food passes into the stomach. It is large enough to line the stomach evenly when it is fully distended, but it is thrown into folds when the stomach is empty and shrunken.

At the *pyloric orifice,* the muscular fibers form a sort of *sphincter,* which contracts the aperture and prevents the passage of any matter into the small intestines until properly digested. In the muscular coat of the stomach are many nerve cells. The food is propelled along the œsophagus by the contraction of the muscular rings of that organ, and enters the stomach in successive waves. The fibers of the muscular coat run in different directions and by their contractions the food is stirred up and mixed with the gastric juice in a peculiar churning motion, its object being a thorough intermixture of the gastric fluid with the alimentary mass, and a separation from the remainder of that portion which has been sufficiently reduced. This motion causes not only a constant agitation of the contents, but also moves them slowly along from one extremity to the other. These revolutions are completed in from one to three minutes, being slower at first than after chymification has become more advanced. The passage of the chyme, or product of the gastric digestion, through the pyloric orifice into the commencement of the intestinal tube is at first slow; but, when the digestive process is nearly completed, it is transmitted in much larger quantities.

THE INTESTINES.

The Intestines form that part of the alimentary canal which extends from the stomach to the anus. They are divided into the *small* and the *large* intestine. The *small intestine* commences at the pylorus and ends, after many windings, in the large. It is about twenty feet long and narrows from about two inches in width at its gastric end to about one and

two-thirds inches at its lower portion. Externally, there are no lines of subdivision on the small intestine, but it is described by anatomists as consisting of three parts: the first twelve inches being the *duodenum;* the succeeding two-fifths of the remainder, the *jejunum,* so called because it is usually found empty after death, and the rest, the *ileum.* Like the stomach, the small intestine has four coats: a serous, a muscular, a submucous, and a mucous. Throughout the greater portion of its length the mucous coat of the small intestine is raised into permanent folds, which run traversely for a greater or less way around the tube. These folds are known as *valvulae conniventes* and greatly increase the surface of the mucous membrane, both for absorption and secretion; they also delay the food somewhat in its passage, since it collects in the hollows between them and is thus longer exposed to the action of the digestive liquids. The mucous membrane is covered everywhere by minute projections, known as the *villi;* they contain blood vessels and lacteals by which the nutritious portion of the food is absorbed. Small glands, the *crypts of Lieberkühn,* open on the surface between the bases of the villi. The muscular coat of the small intestine is composed of two layers of muscular tissue, the inner being circular and the outer, longitudinal. By their contractions, they force the food along the tube. The *large intestine* forms the last portion of the alimentary canal. It is about five feet long and from one and one-half to two and one-half inches in diameter. Anatomists divide it into three divisions: the *caecum,* with the vermiform appendix; the *colon,* and the *rectum.* The small intestine opens into the large intestine by the *ileo-caecal valve,* not at the commencement of the large intestine, but at its side, some distance from its closed upper end. The *caecum* is that part beyond the opening; from it projects the *vermiform appendix,* a narrow tube about four inches long and of about the thickness of a pencil. Appendicitis is inflammation of the vermiform appendix. The *colon* commences on the right side of the abdominal cavity, where the small enters the large intestine, ascends on that side (*ascending colon*), crosses the middle line (*transverse colon*) below the stomach, and descends on the left side (*descending colon*), making an S-shaped bend known as the *sigmoid flexure;* from this the *rectum* proceeds—so called because it is in nearly a straight line—to the anal opening.

The large intestine has the same coats as the small. The mucous coat possesses no villi nor valvulæ conniventes; it is usually thrown into folds like those of the stomach, but smaller. It contains numerous glands, which are much like the crypts of Lieberkühn of the small intes-

tine. The ileo-cæcal valve allows matter to pass readily from the ileum into the large intestine, but not the reverse way. The villi have every variety of shape, from oblong, curved, and serpentine ridges, to the laterally flattened cone standing on its base.

The small intestine receives secretions formed by the glands imbedded in its walls, and also those of the liver and pancreas, the ducts of both opening by a common aperture into the duodenum about four inches from the pylorus.

The Pancreas or Sweetbread is a single glandular organ of a pinkish-yellow color, lying along the great curvature of the stomach. It is of an irregular, elongated form, from six to eight inches in length, an inch and a half in breadth, and from half an inch to an inch thick. In structure, the pancreas resembles the salivary glands, but it is looser and softer in texture. It secretes a watery-looking secretion, called the *pancreatic juice,* the office of which is to emulsify fats so that the lacteals can absorb them. The amount daily secreted by a man is from five to seven ounces, and it is most abundant at the commencement of digestion. It is drained by a duct, which enters the common bile duct.

THE LIVER.

The Liver is the largest gland in the body, ordinarily weighing from fifty to sixty ounces. It lies under the short ribs, rather more on the right than on the left side and immediately below the diaphragm, with which its upper surface is in contact, while its lower surface touches the intestines and the right kidney. It is invested by a coat of peritoneum, which keeps it in place. It is of a dark, reddish-brown color and of a soft, friable texture. Its form is irregular, being convex and smooth above, where it fits into the cavity of the lower surface of the diaphragm, and irregularly concave below. It is thick behind, but ends in a thin edge in front. A deep fissure incompletely divides it into two principal lobes—the *right* and *left lobes*—of which the former is much the larger; several minor lobes are marked off on its under surface by shallow grooves. A duct passes out from each half of the organ, uniting to form the *hepatic duct,* into which empties the cystic duct which proceeds from the gall bladder. The common bile duct, formed by the union of the hepatic and cystic ducts, opens into the duodenum.

The liver, like other viscera of the abdomen, receives an investment of that cavity, the peritoneum, beneath which is a dense connective tissue, forming the *capsule of Glisson.* Offsets from this canal run in and line canals, the *portal canals,* which are tunneled through the organ.

The liver is built up of a vast number of minute polygonal masses, or *lobules,* each of which is very granular and consists of a number of *hepatic cells,* separated from neighboring lobules by connective tissue. The secretion of bile, though the chief of the functions of the liver, is not the only one which it has to perform; important changes are effected in certain constituents of the blood, in its transit through this gland, whereby they are rendered more fit for their subsequent purposes in the animal economy. Its cells take out of the blood excess of sugar and store it up in the form of a kind of animal starch (glycogen), which they afterwards give out again as sugar when the blood needs it. The liver receives all the blood from the stomach and intestines (the portal system). Its cells destroy old red corpuscles and it is believed that they are the means of oxidizing nitrogenous materials into urea, in which form they are excreted by the kidneys. The retention of the materials of the bile in the blood acts like a poison, and, if the suspension of secretion is complete, death soon takes place.

The blood vessels of the liver are the hepatic artery and veins, and the portal vein. The liver receives two kinds of blood: arterial, for the nourishment of the gland, and venous, from which the bile is principally formed; the former brought directly from the aorta by the hepatic artery, the latter by the portal vein from the capillaries of the stomach, intestines, pancreas, and spleen.

The Gall Bladder is an oblong, membranous receptacle, situated on the concave side of the liver, under the right lobe. It is about the size of a small hen's egg and resembles a pear in shape. It serves as a reservoir for the bile, which, when digestion is not going on, regurgitates through the cystic duct, and is retained for future use.

The Spleen is an elongated, flattened, red body, abundantly supplied with blood by an artery (*splenic artery*), which proceeds almost directly from the aorta. It lies on the left side, just under the diaphragm, and close to the stomach and pancreas. Its size is very variable; enlarging during digestion and shrinking after it until the next meal. There is much doubt as to the real function of the spleen. It was thought by the ancients to be the seat of melancholy. The blood of the splenic vein is found to contain proportionally fewer red corpuscles, but more colorless corpuscles and more fibrin than that of the splenic artery; and it has been supposed that the spleen is one of those parts of the economy in which the colorless corpuscles of the blood are especially produced. It is not an essential organ; animals from which it has been completely removed can live a long time in good health.

THE SKIN.

The Skin, although apparently very simple in its structure, is a very compound organ. It is not only the seat of common sensation, but, by means of the vapor which it constantly emits in the form of perspiration, it becomes the great regulator of the heat of the body. For these purposes, it is supplied with nerves, blood vessels, and glands. It has two layers: the *cuticle* or *epidermis* (outer), and the *dermis* or true skin (inner), of which hairs and nails are excessively developed parts. The *epidermis* consists of cells arranged in many layers and united by a cementing substance. It is penetrated by the ducts of the sweat glands, which have their mouths along the ridges. Nerves penetrate the deeper layers, but no blood vessels enter it. The *dermis* is made up of strong, interlacing fibers of connective tissue. It contains lymphatic nerves, blood vessels, hair bulbs, sweat glands, and sebaceous glands. The upper surface is covered with papillæ. The under surface merges into the loose connective tissue (subcutaneous areolar tissue), which lies between the skin and the flesh. Fat accumulates in this and permits the skin to be moved, easily and with no pain, over the tissues, immediately beneath it. The thickness of the skin varies from one-fiftieth (eyelids) to about one-sixth of an inch (small of the back). In blisters, the epidermis is separated from the layer beneath it by the fluid which fills the vesicle, thus showing the thickness of the epidermis. The *papillae* are minute projections from the outer surface of the derma, and contain the terminations of nerves and blood vessels. They are about one-hundredth of an inch in length, and one-two-hundred-fiftieth of an inch broad at the bottom. In some parts of the body they are scattered irregularly on the surface of the derma, and in other regions, as on the palm of the hand and on the fingers, they are arranged in rows. In these the sense of touch is most highly developed. The skin is provided with two distinct sets of glands: *sebaceous and sweat.* The sebaceous glands are generally situated near the roots of hairs and secrete a peculiar, fatty matter from the system, while the secretion itself prevents the skin from being dried and cracked by the influence of the sun. These glands are distributed more or less closely over the whole surface of the body, but are most numerous in those parts which are largely supplied with hair, such as the scalp and face, and are thickly distributed about the entrances of the various passages into the body as the nose, lips, and external ear. They are altogether absent in the palms of the hands and the soles of the feet; they appear

to be made up of an aggregate of small vesicles, and these small vessels are filled with an opaque white substance, something like soft ointment. These glands are overspread with minute capillaries or blood vessels, and their ducts open either into the surface of the skin, or directly into the follicles of the hair. These follicles are, in fact, among the secretory organs of the skin, since it is only at their root that the material produced from their walls is appropriated to the growth of hair. All the rest goes to anoint the hair and the surface of the skin. Hence it is that the secretion is much more abundant in the inhabitants of tropical climates than in those who inhabit cold countries. But for this benevolent provision of the great Creator, the skin would become parched and dry; and, even with this provision of nature, the natives, of warm countries are in the habit of lubricating their skin with vegetable oils of various kinds, to protect it from the scorching influence of the solar rays. When the openings of these sebaceous glands are closed, the glands continue to secrete and a swelling appears. The retained secretion causes inflammation, which continues until the contents of the inflamed sac are removed. This is the cause of little pimples or boils. The *sweat glands* are microscopic tubes reaching down from the surface of the skin to the loose connective tissues just beneath it (*subcutaneous areolar tissue*). They are found all over the skin, but are most abundant in the palms of the hands, the soles of the feet, and the brow. They are about one-fifteenth of an inch in length and one-four-hundredth of an inch in diameter.

The watery vapor which passes off through the pores of the skin is called *insensible perspiration,* when the quantity is not sufficient to be noticed; *sensible perspiration or sweat,* when it is so profuse as to collect in drops on the surface. It consists chiefly of water, with a small proportion of muriate of soda and free acetic acid. The quantity is at all times very considerable, but it is greatly increased during violent exercise, or in hot weather. The sweat gland possesses a twisted duct, which passes upward to the surface, and through this tube ascends to the surface the perspiration, sensible and insensible. It is estimated that there are about twenty-eight miles of this tubing on the surface of the human body, and that, on an average, from two to three pounds of water daily reach the surface through these channels, and are evaporated. It is supposed that at least one hundred grains of effete nitrogenous matter are daily thrown off from the skin. If this secretion is checked or arrested, it throws additional labor on the kidneys; if it remains in the blood, it will prove fatal to life and health. Great attention should be given

to the functions of the skin, so as to keep the pores open and its action free; and for this purpose nothing is so efficacious as bathing in water of suitable temperature, followed by friction and exercise.

When the skin is subjected to pressure, it becomes thicker in spots where the pressure occurs; where the epidermis is affected, the skin becomes callous. If the derma be affected, the papillæ become enlarged and project above the surface, and *warts* are produced. Where both forms of growth take place, we have *corns*. The under part of the epidermis varies in the amount of coloring matter and in thickness; hence the difference of complexion in different persons. Where persons have no color at all, except the red tinge given by the blood, they are called albinos. The *pigment cells* seem to protect the parts beneath from the action of the sun; sometimes the effect of the sun causes the coloring matter to gather in spots, producing *freckles*. Hairs are slender threads of epidermis which develop on special *dermic papillae* placed at the bottom of hair follicles. They consist of the *stem* and the *root* which is buried in the *hair follicle*. Each hair is made up of a number of epidermic cells arranged to form a fiber. The hair of the Caucasian is cylindrical or flat, that of the negro is flattened or ribbon-like and, hence, it is inclined to curl. The center of each hair is hollow and filled with pigment cells which contain different coloring matter; hence the difference in the color of the hair in different persons. Hair covers nearly the entire surface of the body, except the palms of the hands and soles of the feet, but most of it is of a soft, downy variety.

THE URINARY SYSTEM.

The function of the organs of this system is to separate the urine from the blood and to cause it to be removed from the body. These organs are the *kidneys,* the *ureters,* the *bladder,* and the *urethra.*

The Kidneys are two glandular bodies situated in the lumbar region, one on each side of the spine, in what is usually called the small of the back, where they lie imbedded in fat. They are four or five inches long and two and a half inches broad. Their shape is like the kidney bean and they weigh about half a pound each. Each of them is supplied with blood from the abdominal aorta by a *renal artery,* the blood being returned to the inferior vena cava by the renal veins, one of which leaves each kidney. From each of them issues a duct called the ureter, which conveys the urine to the bladder. The kidneys are composed of two very different structural arrangements—the outer, or cortical, por-

tion being, as it were, granulated, and the inner, or medullary, being fibrous, arranged in pyramids or cones, with their bases resting upon the cortical substance, and their apices, or points, opening into a central cavity, the pelvis of the kidney, or, as it has been called, the brain of the kidney, which may be regarded as an expansion of the upper portion of the ureter.

The ureters are membranous tubes, of about the diameter of a goose quill, eighteen inches long, which run down the back wall of the abdomen, behind the peritoneum, to the bladder, into each side of which they empty their urinary secretion. The openings of the ureters enter the walls of the bladder very obliquely, so that, when the pressure in the bladder rises above that of the liquid in the ureter, the walls of the oblique passage are pressed together and it is closed.

The Bladder is situated in the pelvis, or basin, in front of the rectum. It is a thin, membranous sac, a receptacle for the urine secreted by the kidneys, until it is voided through the urethra. It is attached to the rectum, to the hip bones, to the peritoneum, and to the navel, by several ligaments. In the female, the bladder has the womb between it and the rectum. It is composed of three coats or membranes: the external is serous; the middle, muscular; and the internal, mucous. The external coat is strong and fibrous. The internal is drawn into wrinkles which make it thick and shaggy; it secretes a mucus which prevents it from being injured by the corrosiveness of the urine. The bladder, which contains muscular tissue in its walls, is usually relaxed, thus permitting the urine to flow readily into it from the ureters.

The urine is a highly complex fluid secreted from the blood by the kidneys, containing many solid matters in solution which are no longer of service in the body, and which, if retained, would act as a poison. In a healthy person, when recently voided, it is a clear, limpid fluid of a pale-yellow or amber color, with a peculiar faint, aromatic odor, which becomes pungent and ammoniacal when decomposition takes place. Often, however, as it cools, it becomes opaque and turbid from the deposition of part of its constituents previously held in solution, and this may be consistent with health. The urine is retained in the bladder by means of a circular muscle, called a *sphincter,* which closes the part called the neck of the bladder, where it joins the urethra. When the quantity of urine is so increased as to give some uneasiness or pain, the bladder contracts and presses on its contents, the ureters are closed in the way explained above, the *sphincter* of the bladder relaxes, and the urine is discharged through the urethra. The *urethra* is a membranous

canal which leads from the neck of the bladder. It is composed of two layers: a mucous and an elastic fibrous. Through this channel, which is curved in its course, the urine passes out of the body.

The quantity and composition of the urine vary greatly, according to the time of day; the temperature and moisture of the air; the fasting or replete condition of the alimentary canal; and the nature of the food. It is especially diminished by anything which promotes perspiration, and increased by conditions, as cold to the surface, which diminish the skin excretion. An average healthy man excretes by the kidneys about fifty ounces, or twenty-four thousand grains of water a day. Normal urine consists, in 1,000 parts, of about 960 water and 40 solids. The solids are mainly *urea* and uric acid, but small quantities of pigments and of non-nitrogenous organic bodies are also present, and a considerable quantity of mineral salts. The gases are the same as those in the blood; namely, carbonic acid, oxygen, and nitrogen. But the quantity is, proportionally, less than one-third as great; and the carbonic acid is in very large, while the oxygen is in very small, amount.

GENERATIVE ORGANS.

The organs of generation in the male are: (1.) The testes and their envelopes, namely: the scrotum; the dartos, which corrugates or ridges the scrotum, and the fibrous tunics by which they are invested. We must also here include the epididymis, the vas deferens or excretory duct, the spermatic cord, and the spermatic artery. (2.) The vesiculæ seminales, forming a receptacle or reservoir, situated beneath the bladder, for holding the seminal fluid secreted by the testicles. (3.) The prostate gland, surrounding the neck of the bladder and the commencement of the urethra. (4.) Cowper's glands, a pair situated below the prostate. (5.) The ejaculatory ducts. (6.) The penis, which consists of the corpus cavernosum, the urethra, the corpus spongiosum, which terminates in the glans penis; then there are the vessels, nerves, and a cutaneous investment.

The principal female organs of generation are: (1.) The ovaries. (2.) The Fallopian tubes. (3.) The uterus and its ligaments. (4.) The vagina. (5.) The vessels and nerves. (6.) The external organs of generation, which it is needless to describe.

The Perinaeum is the space between the anus and the external parts of the generative organs and is named thus from being frequently moist. The operation of cutting for stone in males is usually performed

here, and here it is that serious injury sometimes occurs, when persons fall with their legs astride of any object, or get a bruise while in that position, as on horseback; bloody urine, or complete stoppage, may be the consequence, arising from inflammation of the bladder or urethra.

We abstain from giving cuts of these several parts and organs for sufficiently obvious reasons; in a book intended for family use they would be objectionable. With regard to the diseases which more immediately affect them, a few simple remarks will be made under their several heads; but we would here impress upon our readers the necessity of at once seeking medical advice for all affections of the genital organs. It is in the treatment of this peculiar class of diseases that advertising quacks reap their richest harvest, often entailing great present sufferings and fearful after-consequences. There is no class of men so dangerous to the masses as the self-styled "Doctor," who travels about the country advertising to cure all ailments of mankind.

THE EYE.

The eyeball, globe of the eye, or organ of vision, is a complex optical apparatus imbedded, to a large extent, in loose fat, and attached behind to the optic nerve. On its exterior are attached the tendons of several muscles, by which the eyeball is moved. Its form approximates to the spheroidal but it really consists of segments of two spheres, the posterior being the larger and having set on to its front a portion of a sphere of smaller radius, which forms the anterior transparent segment of the eye; from side to side it is about one inch in diameter, and from before back, about nine-tenths of an inch. When we take a side view of the eye, we see the anterior portion projecting like a bow window, as it were; it is, in fact, the window of the chamber, and through it pass the rays of light, which form images on the retina within, of outward scenes and objects. In general terms, the eyeball may be described as consisting of three coats, or tunics, which inclose three translucent refracting media. The lines encircling the globe represent the coats by which the humors are kept in their places.

The first external coat consists of a posterior, white, opaque part, the *sclerotic,* which is seen between the eyelids, as the *white of the eye,* and of an anterior, translucent part, the *cornea.* Both are tough and strong, being composed of dense connective tissue, and are covered by a thin layer of the conjunctiva.

The veins of the choroid coat are known as the *venae vorticosae,*

from the peculiar manner of their arrangement. The external layer of the choroid towards the front of the eyeball is thrown into plaits, the *ciliary processes,* the processes being continuous with the *iris,* a structure which lies behind the cornea and which forms the colored part of the eye seen through the cornea. The middle or arterial layer of this coat is composed chiefly of the ramifications of minute arteries. The internal layer is composed of minute six-sided cells, which are arranged like a tessellated pavement and contain much pigmentary matter of a dark brown color. These pigment cells are separated from the vitreous humor by the retina, the rods and cones of which are in immediate contact with them. The pigment in the iris determines the color of the eye. The choroid does not, like the outer one, completely envelop the eyeball.

The *retina,* the third coat, is a still less complete envelop than the second tunic, extending forward only as far as the commencement of the ciliary processes. The fibers of the optic nerve spread out in the retina, penetrating the sclerotic and choroid. At the place where the optic nerve enters, the retina is whiter than elsewhere and presents an elevation, the *optic mound.* The *yellow spot* (maculæ lutea) lies outside the optic mound, nearly at the posterior end of the axis of the eyeball. The veins and capillaries of the retina are completely invested by perivascular lymphatic sheaths, while the arteries only possess such sheaths for a limited part of their course. The foramen, which signifies an opening, has been found to exist only in animals which have the axes of the eyeballs parallel with each other, as man, the quadrumania, and some saurian reptiles.

On entering the eye, a ray of light passes through the following refractory media: the *cornea,* the *aqueous humor,* the *crystalline lens,* and the *vitreous humor.* The aqueous humor, a limpid, watery fluid, containing a little common salt in solution, fills the space between the cornea and the front of the crystalline lens.

The *crystalline lens* is situated behind the iris and pupil and in front of the vitreous humor. It is colorless, transparent, and biconvex, with its posterior surface more convex than the anterior, and with its circumference surrounded. It is invested by a capsule and in front lies in contact with the inner edge of the iris. It is retained in place by the suspensory ligament of the lens. It is built up of concentric layers, the central layers being more dense than the outer. In consistence it is soft, but it is denser and capable of refracting light more strongly than either of the humors. The *vitreous humor,* which is rather a soft jelly than a

regular fluid, is enveloped in a thin capsule, the *hyaloid membrane.* This membrane splits in front into two layers, one of which forms the suspensory ligament of the lens, the space between the two layers being known as the *canal of Petit.* The vitreous humor consists of water, salts, albumen, and mucin, but the main part is water.

A brief summary of the uses of the different parts of the eye will assist in studying it as an optical instrument. The sclerotic coat is simply one of protection; the cornea is a medium for the admission of light; the choroid contains blood vessels to nourish different parts of the eye, and by its pigmentary matter absorbs all scattered rays of light, by which an image impressed on the retina might be confused. The *iris,* by its power of expansion and contraction, regulates the quantity of light admitted through the pupil; when the light is too strong, the retina is irritated and, by reflex action, the iris contracts; when there is not sufficient light, it relaxes and the pupil enlarges to admit more light. The iris covers the edges of the crystalline lens and allows the light to come through the center and near parts only, thus preventing spherical and chromatic aberration. By means of the crystalline lens, light is brought to a focus on the retina. In *far-sighted* or *hypermetropic eyes,* the lens is too flat or the eyeball is too flat or the eyeball is too short, causing the rays to focus behind the retina; in *near-sighted* or *myopic eyes,* the eyeball is elongated, causing the rays to focus in front of the retina, the rays crossing each other and blurring the image. Glasses aid vision by regulating the rays of light as they enter the eye and causing them to focus on the retina. Sometimes the choroid fails to absorb the light when it is intense and it is reflected through the retina, thus confusing the sight. Albinos are troubled with dimness and confusion of sight because the coloring matter of the choroid coat is absent.

The convexity of the crystalline lens is controlled by muscles which make it greater when we look at near, and less when we look at distant, objects; this adjustment, to correspond with the varying distance of external objects, so that their images may fall upon the retina, is known as the *function of accommodation.* The ciliary muscle, by contracting and relaxing, assists in the function of accommodation. In healthy eyes, the inner limit of distinct vision is usually about six inches from the cornea; without artificial assistance, the eye cannot distinguish objects perfectly in their minute details, beyond a distance of fifty feet. When the optic nerve is stimulated, as by a shock to the retina, it transmits it to the brain under the form of light. If the eyeball is struck, we see sparks

or flashes of light even in the dark; this proves that the optic nerve conveys only the sensation of light.

The appendages to the eye are the eyebrows (*supercilia*) and the eyelids (*palpebrae*). The eyebrows are two prominent arches of integument, covered more or less with thick, short hairs, and forming the upper boundary of the orbits; their obvious utility is to shade the eyes from too vivid a light, and to protect them from particles of dust and moisture from the forehead. The eyelids consist of integuments, muscles, cartilages, glands, and the mucous membrane called the conjunctiva, which covers the whole of the anterior surface of the eye, and is reflected back so as to form the internal layers of the lids. They have been called the *"curtains of the eyes,"* and protect the eyes, when closed, as in sleep. On examining the inner aspect of the eyelids, the *Meibomian glands* can be distinctly seen, arranged like strings of pearls, about thirty, on the cartilage of the upper lid, and somewhat fewer in the lower, where they are shorter than those above, as they correspond in length with the breadth of the cartilage. Each of these glands consists of a single lengthened follicle, or tube, into which a great number of small clustered glandular vesicles open; and from these tubes the secretion is poured out upon the margins of the lids, which, being thus kept constantly moist inside, are in a condition to lubricate and wash the surface of the cornea, which they do in the motion of winking.

The eyelashes (*cilia*) are important organs of defense for the delicate surface of the eye, for whose curtains they form, as it were, a silken fringe.

THE EAR.

The Ear, the organ of the sense of hearing, is a complex acoustic apparatus and consists of three parts, known respectively as the *external ear,* the *middle ear* or *tympanum,* and the *internal ear* or *labyrinth.* The external ear consists of the pinna or auricle, and the external auditory meatus; the former collects the sound waves, and the latter conveys them to the internal ear and is about one and a quarter inches in length. The pinna or auricle is the trumpet-shaped, cartilaginous structure situated at the side of the head. It consists of an uneven piece of yellow, elastic fibrocartilage invested by integument, except the lobule, which consists merely of a fold of integument containing fat. The external meatus leads from the bottom of the concha (the deep hollow of the pinna) into the temporal bone and is closed at its inner end by the *tympanic* or *drum membrane.* The wall of the outer end is formed of

cartilage and membrane; that of the deeper end, of the plate-like tympanic part of the temporal bone. The skin lining the auditory canal is very thin, and closely adherent to the cartilaginous and osseous portions of the tube. It is continued over the membrane of the tympanum in the form of a thin pellicle, forming its outer covering, and in it are situated numerous hairs, together with ceruminous glands which secrete the well-known yellow *earwax*.

The tympanum, drum, or middle ear is an irregular chamber situated in the temporal bone, and interposed between the bottom of the *meatus auditorius* and the labyrinth or inner ear. It is filled with air, and communicates, at its interior wall, with the nasal part of the pharynx immediately behind the inferior turbinal, by means of the eustachian tube; at its posterior wall, it communicates with the air sinuses in the mastoid temporal. The tympanic cavity is traversed by an irregular chain of three small movable bones, connecting the membrana tympani with the labyrinth and serving to convey the vibrations of air which strike the membrana tympani, across the tympanic cavity to the internal ear. These bones are the *malleus* or hammer, the *stapes* or stirrup-shaped, and the *incus;* they are moved by muscles, and are bound together and connected with the tympanum by ligaments. The tympanic membrane stretches across the outer side of the tympanum and is concave on its outer and convex on its inner surface; this membrane is a thin semi-transparent substance, nearly oval in form and consists of three layers. It is pressed on the external side by the external air, and on the interior side by the air entering the tympanic cavity through the eustachian tube. This tube is usually closed, but every time we swallow it is opened, thus equalizing the air pressure in the cavity to that in the external auditory meatus; if the tympanum were closed, the drum membrane would bulge in or out as the barometric pressure varied. If the eustachian tube were always open, we would be disconcerted by the loud sounds of our

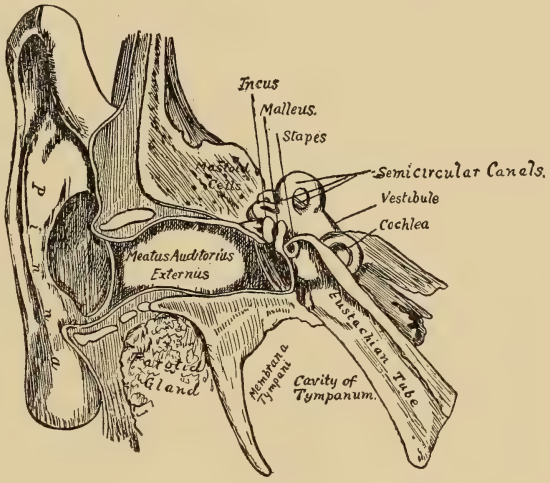


FIG. 188. FRONT VIEW OF THE EAR.

own voice. Frequent swallowing movements will greatly alleviate painful tension of the drum membrane, caused by sudden and great change of aerial pressure, such as we experience in making a balloon ascent or in going rapidly down a deep mine.

The Internal Ear, called from its complex construction the *labyrinth,* is divided into three parts; namely, the vestibule, the semicircular canals, and the cochlea. It consists of a series of cavities channeled out of the substance of the petrous bone, communicating externally with the cavity of the tympanum, and internally with the meatus auditorius internus, which contains the auditory nerve. Within the osseous labyrinth is contained the *membranous labyrinth,* upon which the ramifications of the auditory nerve are distributed; it has the same divisions as those of the bony labyrinth.

The Vestibule is the central part of the bony labyrinth and has on its exterior the *oval foramen,* into which the base of the stirrup bone fits. It lies between the tympanum and the bottom of the internal auditory meatus; the semicircular canals are behind it, the cochlea being placed in front of it. The bony semicircular canals are three in number and are named superior, posterior, and external. They communicate with the back of the vestibule at each end and dilate at one end to form an *ampulla.* They are about one-twentieth of an inch in diameter.

The bony *cochlea,* so called from its resemblance to a small shell, is by far the most complex part of the labyrinth and is placed almost horizontally in front of the vestibule. Its length is about one-fourth of an inch and its width, at the base, about the same. It is a tube wound spirally two and a half times around a central pillar, or *modiolus,* both the pillar and the tube diminishing rapidly in diameter from the base to the apex of the cochlea. A delicate lamina is contained within the canal, following its windings and subdividing it into passages by a plate of bone, the *osseous spiral lamina,* which, springing from the modiolus, winds spirally around it and projects into the tube. The whole inner surface of the labyrinth, including the semicircular canals and the passages of the cochlea, is lined with a thin, fibrous membrane, the outer surface of which adheres closely to the bone, while the inner is covered with a single layer of epithelium, like that on serous membranes, and secretes a thin serous fluid. The membranous internal ear is filled by a watery fluid called the *endolymph;* the space between the bony labyrinth and the membranous internal ear, by a similar fluid called the *perilymph.* The auditory nerve, which is distributed over the different parts of the labyrinth, enters by

the meatus auditorius internus, and divides into two branches; an interior for the cochlea, and a posterior for the membranous labyrinth.

Physiology and physics consider sound from different standpoints; the former treats of it as a sensation produced by air waves striking the ear drum, the effect being communicated to the brain; the latter, as a movement of the air in waves without regard to the sensation. The different qualities of sound depend on the different length, rapidity, height, and character of the air waves. Colds in the head affect the hearing by causing the membrane around the mouth of the eustachian tube to swell. The imflammation sometimes reaches the middle ear and the chain of little bones becomes stiffened so that they do not conduct the vibrations of the membrane of the tympanum; thus permanent deafness may result.

THE TONGUE.

The Tongue is composed of muscular fibers; between these fibers is a considerable quantity of adipose substances, and in the middle is a vertical septum of fibrous tissue. The tongue is attached by its root to the hyoid bone. Numerous small eminences or *papillae* are found on its upper surface; these are of three forms—*circumvallate, fungiform,* and *filiform.* The *circumvallate* lie near the root of the tongue and number from seven to twelve; each is an elevation of the mucous membrane. The *fungiform* are rounded elevations and are found all over the middle and fore parts of the upper surface of the tongue. The *filiform papillae,* the most numerous and smallest, are scattered all over the dorsum of the tongue, except near its base. The taste goblets are buried in the epidermis of the circumvallate and in some of the fungiforms.

The papillæ contain blood vessels and nervous filaments from two sources; the *glossopharyngeal* nerve and the *gustatory* nerve. The former chiefly supplies the back of the tongue and the adjacent parts of the palate; the latter, the front of the tongue, the region which is more especially the seat of the sense of taste. Most of the taste sensations are complex sensations into which smell and even touch largely enter. When the sense of smell is interfered with, as when the nose is held tightly pinched, it is very difficult to distinguish the taste of various objects.

The mucous membrane, as well as the form of the tongue, is liable to considerable changes in appearance, indicative of disordered states of the system. It is on this account that it is so often examined by physicians in diagnosing diseases. When the digestive organs are deranged, the tongue is commonly covered with a thick, yellowish coat, and there is frequently a "bad taste in the mouth."

The structure of the mucous membrane of the tongue differs in different parts. That covering the under surface of the organ is thin, smooth, and identical in structure with that lining the rest of the oral cavity. The mucous membrane on the anterior part of the dorsum of the tongue is thin, whilst that at the root is much thicker and looser. It consists of a layer of connective tissue, the *corium* or *mucosa,* supporting numerous *papillae* and covered, as well as the *papillae,* with *epithelium.*

THE TEETH.

When the child is born the jaw is covered with gums, but underneath the gums are vascular and nervous *papillae* inclosed in *dental sacs;* there are five on each side of each jaw, making twenty in all. Each papilla gradually assumes the form of the future tooth, and as it keeps on growing it at last presses upon the gum and, causing it to absorb, finally breaks through it. The process is called *dentition.* It is frequently a source of disordered health to children, especially if anything occurs to prevent the absorption and ready yielding of the gum to the pressure of the tooth below.

First or Milk Teeth.

2 lower middle incisors,.....4th to 8th month.
2 upper middle incisors,.....4th to 8th month.
4 lateral incisors,..... 4th to 11th month.
4 anterior or first molars,..... 12th to 18th month.
4 eye or canine teeth,.....16th to 22d month.
4 back molars,.....19th to 38th month.

20.

Order of Appearance of the Permanent Teeth.

4 first molars, one on each of the two sides of the two jaws,.....6th to 7th year.
4 middle incisors, two in each jaw,...7th to 8th year.
4 lateral incisors, a little later than the last,.....
.....7th to 8th year.
4 first bicuspids,.....8th to 9th year.
4 last bicuspids,.....11th to 12th year.
4 eye or canine teeth,.....11th to 13th year.
4 second molars,.....12th to 14th year.
4 back molars or wisdom teeth,....18th to 30th year.

32.

BOOK XI.

MATERIA MEDICA

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Materia Medica is the science which deals with the sources and preparations of drugs and other medical agents. The term is of Latin origin and means medical matter or material.

A drug is any substance, either simple or compound in its chemical or physical nature, either in its natural or in a prepared state, either by itself or in union with other substances, used as a medical agent. There is no feature of the history of drugs of which Materia Medica does not treat. Drugs are classified upon a threefold basis:—

1. As to their source, origin, or derivation.
2. As to their effects upon the several organs and functions of the human body.
3. As to their prepared state according to the rules of pharmacy and their standard strength according to fixed formulæ.

Sources.—Medicine draws upon the vegetable, mineral, and animal worlds for its curative agents. The contributions are most abundant from the vegetable world, and fewest from the animal world.

Drugs of Vegetable Origin.—Sometimes the medicinal property extends to every part of a plant equally; but generally it is lodged in some part only. The flowers, seeds, fruits, leaves, roots, or bark of many plants are represented in the list of curative agents. The active principle upon which the curative properties depend may in a few cases be derived by steeping to form an infusion; or by boiling to make a decoction; but in the great number of cases they are derived by intricate and complex chemical processes in which special apparatus is employed. From the vegetable world are derived alkaloids, oils, gums, resins, oleo-resins, sugars, starches, glucosides, albuminous compounds, and many principles. The most important of these products are the alkaloids.

Drugs of Mineral Origin.—The earth yields many important inorganic compounds of great service in medicine: the alkalies, alkaline earths, metals, acids, and the great class of carbon compounds and coal-tar products.

Drugs of Animal Origin.—These are few in number but include such valuable agencies as cod-liver oil, Spanish flies, pepsin, pancreatin, and the useful vehicles lard and lanolin.

Physiological Effects of Drugs.—It is important to remember that a drug may manifest its power in more than one way. In classifying them, however, recognition is made of only the most important and remarkable of the characteristics of a drug and all of its minor or less valuable effects are ignored. This principle greatly simplifies what would otherwise be an extremely difficult work in classification as to their effects. If notice were taken of all of the effects of a drug, the same agencies would appear in many of the divisions. Another difficulty in classification lies in those individual peculiarities of patients which are known among medical men as "idiosyncrasies." In many cases there is such marked susceptibility to the effects of a drug in even small doses as to entirely prohibit its use. As a rule sensitive and nervous temperaments respond most quickly to the effects of a drug and consequently require much smaller doses than do the coarser-fibered and more phlegmatic.

The ability of the human body to accommodate itself to the long-continued use of drugs and to tolerate larger and larger doses is the underlying cause of the formation of what we call the "drug habit." The body on the other hand has a remarkable power of storing up in its tissues the excess of drugs which it is unable to excrete as rapidly as supplied. From this results what is known as the "cumulative effect" of drugs.

CLASSIFICATION OF DRUGS ACCORDING TO THEIR PHYSIOLOGICAL EFFECTS.

1. **Absorbents.**—Drugs which cause absorption and exudation of diseased tissues.

Iodine and the iodides.

2. **Alteratives.**—Drugs which in some unknown way alter or change pathological or morbid conditions and modify the nutrition of the body.

Antimony.
Arsenic.
Cod-liver Oil.
Colchicum.
Gold Chloride.
Iodine.
Mercury.
Sarsaparilla.

3. **Anæsthetics.**—Drugs which produce unconsciousness and insensibility to pain. They are divided into general anæsthetics, which produce unconsciousness, and local anæsthetics, which affect only the part to which they are applied.

General Anaesthetics.

Alcohol.
Chloroform.
Ether.
Nitrous Oxide.

Local Anaesthetics.

Carbolic Acid.
Cocaine.
Eucaine.
Ethyl Hydrate.
Intense Cold.

4. **Analgesics** or **Anodynes.**—Medicines which allay pain.

General Analgesics.

Belladonna.
Hypnotics.
Narcotics.
Stramonium.

Local Analgesics.

Aconite.
Carbolic Acid.
Chloroform Liniment.
Cocaine.
Menthol.
Opium.

5. **Antacids.**—Drugs which neutralize acids in the stomach or bowels.

Salts of Lithium.
Salts of Potassium.
Salts of Sodium.

6. **Antagonists.**—Drugs which counteract the effects of other drugs. They differ from antidotes in that they may be used after the drug has entered the system, when the use of antidotes would be too late.

7. **Anthelmintics.**—Drugs which are used to kill and expel worms; vermicides and vermifuges.

Alum.
Filix Mas.
Pelletierine.
Pepo (Pumpkin Seed).
Quassia.
Santonin.
Senna.
Sodium Chloride or Common Salt.
Spigelia.
Tannin.
Turpentine.

8. **Antidotes.**—Drugs which act upon poisons while they are in the alimentary canal and before they are absorbed into the system.

They act by combining with the poisons and change their chemical composition, or remove them.

9. **Antilithics.**—Drugs which prevent the deposit of urinary sediment, which causes calculus or stone in the bladder.

Ammonium Benzoate.
Benzoic Acid.
Lithium Salts.
Lycetol.
Piperazin.
Potassium Salts.
Salicylic Acid.
Sodium Salts.
Uricedin.

10. **Antiperiodics.**—Medicines which prevent the recurrence of attacks of a periodic disease.

Eucalyptus.
Hydrastis.
Quinine.

11. **Antiphlogistics.**—Medicines which counteract fevers by reducing the temperature.

12. **Antipyretics.**—Medicines which reduce the temperature of the body in fevers.

Acetanilid.
Aconite.
Antipyrin.
Asaprol.
Chinolin.
Cold.
Guaiacol.
Phenacetin.
Quinine.
Resorcin.

13. **Antiseptics.**—Agents which prevent the growth of bacteria.

Boric Acid.
Carbolic Acid.
Corrosive Sublimate.
Creolin.
Iodoform.
Salicylic Acid.
Thymol.

14. **Antispasmodics.**—Drugs which relieve convulsions or spasms.

Alcohol.
Amyl Nitrite.
Aromatic Oils.
Asafœtida.
Bromides.
Camphor.
Chloroform.
Ether.
Hoffman's Anodyne.
Musk.
Valerian.

15. **Aperients.**—Laxatives or mild purgatives.

Castor Oil.
Figs.
Glycerine.
Magnesia.
Olive Oil.
Prunes.
Sulphur.
Tamarinds.

16. **Astringents.**—Drugs which condense tissues, contract vessels, and reduce the secretions from mucous membranes.

Acetic Acid.
Alum.
Bismuth Salts.
Catechu.
Copper Salts.
Gallic Acid.
Hamamelis or Witch Hazel.
Iron Salts.
Lead Salts.
Nutgalls.
Silver Salts.
Tannic Acid.
Zinc Salts.

17. **Cardiac Depressants** or **Sedatives.**—Medicines used to lessen the force and frequency of the heart's action.

Aconite.
Antimony.
Digitalis.
Ergot.
Pilocarpin.
Veratrum Viride.

18. **Cardiac Stimulants.**—Medicines used to increase the force and frequency of the heart's action.

Alcohol.
Ammonia.
Atropin.
Chloroform.
Ether.
Strychnine.

19. **Carminatives.**—Medicines which relieve flatulence and griping and expel wind from the stomach and intestines.

Asafœtida.
Camphor.
Capsicum.
Cardamom.
Cinnamon.
Ginger.
Musk.
Peppermint.

20. **Cathartics.**—Purgatives.

Simple Purgatives.

Aloes.
Cascara Sagrada.
Castor Oil.
Eupatorium.
Glycyrrhiza or Licorice Powder.
Rhubarb.
Senna.

Drastic Purgatives.

Aloes.
Colocynth.
Compound Cathartic Pills.
Croton Oil.
Elaterium.
Gamboge.
Jalap.
Podophyllum.
Scammony.

Saline Purgatives.

Magnesium Salts or Epsom Salts.
Potassium Salts.
Sodium Salts.
Saline Waters.
Hunyadi, etc.

21. **Caustics or Escharotics.**—Medicines used to destroy living tissues.

Acetic Acid, Glacial.
Antimony Chloride.
Bromine.
Carbolic Acid.
Caustic Potash.
Caustic Soda.
Copper Nitrate.
Lime.
Mercury Nitrate.
Nitric Acid.
Silver Nitrate.
Sulphuric Acid.
Zinc Chloride.

22. **Cholagogues.**—Medicines which excite a flow of bile.

Cholagogue Cathartics.

Blue Mass.
Calomel.
Gray Powder.
Iris.
Podophyllum.

23. **Demulcents and Emollients.**—Medicines used to soothe and protect irritated tissues and mucous membranes. Demulcents are mucilaginous emollients.

Acacia or Gum Arabic.
Barley Water.
Borax.
Cacao Butter.
Flaxseed.
Glycerine.
Lard.
Lanolin.
Licorice.
Lycopodium.
Olive Oil.
Starch.
Tragacanth.
Vaseline.

24. **Deodorants.**—Medicines which remove or conceal odors.

Charcoal.
Chloride of Lime.
Chlorinated Soda.
Potassium Permanganate.
Sulpho-Naphthol.

25. **Detergents.**—Medicines employed to cleanse wounds, sores, and ulcers.

26. **Diaphoretics.**—Medicines which cause increased flow of perspiration, thereby assisting or relieving the kidneys and reducing the temperature.

Acetanilid.
Alcohol.
Ammonium Compounds.
Antimony.
Antipyrine.
Asaprol.
Camphor.
Dover's Powder.
Eupatorium.
Heat, Artificial.
Nitrous Ether.
Pilocarpine.
Potassium Salts.
Salicylates.

27. **Disinfectants.**—Substances which destroy disease germs or the harmful effects of fermentation and decay. The number of disinfecting agents is very large.

Aristol.
Benzoin.
Bichloride of Mercury.
Bismuth.
Boric Acid.
Borax.
Carbolic Acid.
Chlorine.
Creolin.
Dermatol.
Eucalyptus, Oil of.
Europhen.
Formalin.
Hydrogen Peroxide.
Iodoform.
Lime.
Lysol.
Naphthalin.
Oxalic Acid.
Permanganate of Potash.
Pyrogallol.
Quinine.
Salicylic Acid.
Sulphurous Acid.
Thymol.

28. **Diuretics.**—Medicines which increase the flow of the urine.

Convallaria.
Digitalis.
Diuretin.
Liquor Potassæ.
Potassium Salts.
Scoparius.
Sodium Salts.
Spirits of Niter.
Squill.
Strophanthus.
Water.

Stimulant Diuretics.

Alcohol.
Buchu.
Cantharides.
Capsicum.
Copaiba.
Cubeb.
Juniper.
Taraxacum or Dandelion.
Turpentine.
Zea Mays.

29. **Ecbolics.**—Drugs which cause contraction of the uterus when gravid or following childbirth.

Cotton-root Bark.
Ergot.
Hydrastis.
Quinine.
Rue.
Savine.

30. **Emetics.**—Medicines which cause vomiting.

Alum.
Apomorphine.
Ipecac.
Mustard.
Salt.
Tartar Emetic.
Warm Water.
Zinc Sulphate.

Antiemetics prevent nausea and vomiting.

Bromides.
Carbolic Acid.
Cerium Oxalate.
Chloral.
Chloroform.
Cocaine.
Creosote.
Iodine.
Limewater.
Morphine.

31. **Emmenagogues.**—Medicines which stimulate, restore, and regulate menstruation.

Aloes.
Cod-liver Oil
Ergot.
Hot Bath.
Hydrastis.
Iron.
Manganese.
Myrrh.
Pulsatilla.
Rue.
Savine.
Strychnine.
Tansy.
Viburnum Prunifolium.

32. **Epispastics** or **Vesicants.**—Blisters.

Cantharides.
Mustard.

33. **Expectorants.**—Medicines which increase or alter the character of the secretions of the pulmonic mucous membranes.

Acids.
Alkalies.
Ammonium Carbonate.
Ammonium Chloride.
Antimony.
Balsam of Peru.
Balsam of Tolu.
Benzosol.
Creosote.
Ipecac.
Senega.
Squill.
Terebene.

34. **Galactagogues.**—Medicines which increase the flow of milk.

Castor Oil Leaves.
Liquids.
Milk.
Pilocarpus.

Antigalactagogues decrease the flow.

Belladonna.
Camphor.

35. **Hæmostatics** or **Styptics.**—Medicines which arrest hemorrhage or flow of blood.

Actual Cautery.
Astringents.
Cold Applications.
Digitalis.
Ergot.
Hot Applications.
Salt.
Strychnine.

36. **Hydragogues.**—Medicines which cause watery discharges from the bowels. See *Cathartics.*

37. **Hypnotics** or **Soporifics.**—Medicines which produce sleep.

Ammonium Bromide.
Amylene Hydrate.
Chloral.
Cocaine.
Exalgine.
Hyoscine.
Hypnal.
Lithium Bromide.
Methylal.
Paraldehyde.
Potassium Bromide.
Sodium Bromide.
Somnal.
Trional.

38. **Laxatives.**—See *Cathartics.*

39. **Mydriatics.**—Medicines which cause the pupils of the eyes to dilate.

Atropin.
Cocaine.
Duboisine.

40. **Myotics.**—Medicines which cause the pupils to contract.

Eserine.
Morphine.
Opium.
Physostigmine.

41. **Narcotics.**—Powerful anodyne hypnotics or soporifics.

Bromal Hydrate.
Cannabis Indica.
Morphine.
Opium.

42. **Rubefacients.**—Medicines which produce redness of the skin.

Ammonia.
Arnica.
Camphor.
Capsicum.
Iodine.
Mustard.
Turpentine.
Veratrine.

43. **Sialagogues.**—Medicines which excite the flow of saliva.

Acids.
Ether.
Mercury Compounds.
Pilocarpus.

Antisialagogues decrease the flow of saliva.

Alkalies.
Atropin.
Morphine.
Opium.

44. **Soporifics.**—Hypnotics.

45. **Stomachics** or **Gastric Tonics.**—Stimulants to the stomach which increase the appetite and aid digestion.

Acids, Dilute.
Alcohol.
Aloes.
Antacids.
Aromatic Ammonia.
Calumba.
Cascarilla.
Chamomile.
Eucalyptus.
Eupatorium.
Gentian.
Hydrastis.
Lime Water.
Liquor Potassæ.
Liquor Sodæ.
Magnesia.
Nux Vomica.
Pancreatin.
Pepsin.
Potassium Bicarbonate.
Pulsatilla.
Quassia.
Quinine.
Rhubarb.
Sodium Bicarbonate.
Taraxacum.
Vegetable Bitters.

46. **Styptics.**—Medicines which stop hemorrhage.

47. **Sudorifics.**—Medicines which produce perspiration. Diaphoretics.

48. **Vermicides.**—Medicines which kill intestinal worms. Anthelmintics.

49. **Vermifuges.**—Medicines which expel intestinal worms.

50. **Vesicants.**—Medicines which cause blisters. Epispastics.

IMPORTANT OFFICIAL DRUGS RECOGNIZED BY THE PHARMACOPOEIA.

Acacia. Gum Arabic. A gummy exudation from *Acacia Senegal* (Willdenow) and other species of acacia. Abundant in western Africa, north of the Senegal, in eastern Africa, Kordofan, and southern Nubia. The chief varieties of gum are: Turkey or Egyptian gum; Barbary, Mogador or Morocco gum; Senegal gum; India gum; and East African gum. Used as a demulcent in catarrhal affections and irritation of the throat; a small piece of gum is allowed to dissolve slowly in the mouth. Used in pharmacy in making pills and troches, and to suspend insoluble substances in water. Mucilage of Acacia consists of half an ounce of gum in each fluidounce of mucilage. Must not be mixed with anything containing alcohol. Syrup of Acacia consists of 1 ounce of gum in 11 fluidounces of syrup.

Acetanilid. Made by the interaction of glacial acetic acid on aniline. An antipyretic, analgesic, and (in small doses) a nerve sedative. Lowers the heart's action. Acts more slowly than antipyrine, and is rather more powerful. May cause in some patients deafness, ringing in the ears, weakness. In rare cases it has caused collapse and heart failure. Used also as a dressing for wounds and ulcers in powder or ointment. Dose from 5 to 8 grains.

Acetate of Opium. See Vinegar of Opium.

Acetate of Squill. See Vinegar of Squill.

Acids.

Acetic Acid. The most useful of acids to the apothecary; obtained from the destructive distillation of wood or by the oxidation of ethyl alcohol. Acetic acid consists of not less than 36 parts by weight of glacial acetic acid in 64 parts of water. Glacial acetic acid contains not less than 99 per cent by weight of absolute acetic acid and not more than 1 per cent of water. Dilute acetic acid contains not less than 4 per cent by weight of absolute acetic acid and not more than 96 per cent of water. Acetic acid is a mild caustic and is not used internally. Dilute acetic acid is stimulant, astringent, and refrigerant. It is used in baths as a toilet vinegar. When taken internally to increase the appetite and digestion, the dose of diluted acetic acid is from 20 to 40 minims.

Benzoic Acid (*Acidum Benzoicum*). An acid obtained by subliming benzoin. A stimulant expectorant in chronic bronchitis, in uric acid gravel, inflammation of the bladder; is a powerful antiseptic, and is much used in the patented food preservative mixtures; is an ingredient of cosmetic washes. Dose in pill with soap, from 10 to 30 grains.

Boric Acid or Boracic Acid. A feeble acid obtained by the action of sulphuric acid upon borax. A soothing application to the mucous membranes, and nearly free from irritating properties. Used in conjunctivitis, aphthous sore mouth, ulceration of the mouth, and as an antiseptic wash for wounds. Used internally in some forms of inflammation of the bladder. Its safety as a food preservative is in doubt. Dose of boric acid, 5 to 10 grains.

Camphoric Acid. Obtained by the oxidation of camphor. Used extensively in night sweats. Dose, from 5 to 15 grains.

Chromic Acid (*Chromium Trioxide*). A red crystalline solid used as a caustic or escharotic. Not a true acid, but an acid anhydride. Rarely, if ever, used internally.

Citric Acid. Present in the juice of many fruits, and originally obtained from the lemon and lime. Used as a substitute for lemonade and as an ingredient of effervescing salts. Dose, from 5 to 30 grains.

Gallic Acid. Usually prepared from tannic acid by treatment with sulphuric acid. A less powerful astringent than tannic acid; used in all cases of hemorrhage where the acid does not come into direct contact with the vessels. Also used in pyrosis, and in night sweats of phthisis or exhaustion. Dose, 5 to 15 grains.

HYDROCHLORIC ACID. Contains 31.9 per cent of absolute hydrochloric acid. Obtained by the action of sulphuric acid on sodium chloride, common salt. Tonic, refrigerant, and antiseptic. Used in low fevers, phthisis, phosphatic deposits in urine, gastro-intestinal indigestion without diarrhœa. Dose, 5 to 10 minims in a wineglass of water.

DILUTED HYDROCHLORIC ACID. Contains 10 per cent by weight of absolute hydrochloric acid. Dose, from 10 to 30 minims in water.

DILUTED HYDROCYANIC OR PRUSSIC ACID. Contains not less than 2 per cent of absolute hydrocyanic acid. It may be prepared directly and quickly by treating silver cyanide with diluted hydrochloric acid. One of the most deadly poisons known, and very rapid in its effects. A grain and a half of hydrocyanic acid produces death in an adult; and one or two drops upon the tongue will kill a large, strong dog in a few seconds.

LACTIC ACID. Made from milk by fermentation. A pale yellow and syrupy liquid, odorless, and of sour taste. Aids digestion and increases appetite. The diluted lactic acid is composed of 15 parts of Lactic Acid and 85 parts of Water. Dose of the diluted acid is from ½ to 2 teaspoonfuls. Dose of lactic acid is from 20 to 30 minims.

NITRIC ACID. Contains 68 per cent by weight of absolute nitric acid. Made by acting upon sodium nitrate with sulphuric acid. Its specific gravity is 1.403 at 77° F. Tonic, antiseptic, and astringent. Useful in intestinal indigestion. It is to be well diluted and taken through a glass tube to protect the teeth. Dose, from 5 to 10 minims well diluted. It is applied externally to ulcers in the strength of 12 minims to the pint of water. The strong nitric acid is a powerful escharotic.

DILUTED NITRIC ACID. Contains 10 per cent by weight of absolute nitric acid. Dose of diluted nitric acid is from 20 to 40 minims well diluted.

NITROHYDROCHLORIC OR NITROMURIATIC ACID. Known as *Aqua regia* by the early chemists. Made by mixing 18 parts of Nitric Acid with 82 parts of Hydrochloric Acid. It has the power of dissolving gold. Used in baths for hepatitis and biliary calculi; internally in chronic hepatic troubles, dyspepsia with constipation. Taken through a glass tube, well diluted, and after meals. Dose, from 3 to 6 minims.

DILUTED NITROHYDROCHLORIC ACID. Made from Nitric Acid, 4 parts; Hydrochloric Acid, 18.2 parts; Water, 77.8 parts. Dose, from 10 to 20 minims.

OLEIC ACID. Obtained by purifying commercial oleic acid, a by-product from the manufacture of candles and glycerine. Specific gravity, 0.895; insoluble in water; soluble in alcohol, chloroform, benzine, fixed and volatile oils. Used chiefly for preparing oleates and ointments.

PHOSPHORIC ACID. Consists of 85 per cent by weight of absolute orthophosphoric acid. Made by oxidizing phosphorus with nitric acid. Specific gravity, 1.707 at 77° F. Used in making phosphates and lactophosphates.

DILUTED PHOSPHORIC ACID. Composed of 10 per cent by weight of absolute orthophosphoric acid. Tonic and refrigerant; used in dyspepsia, hysteria, diabetes, some forms of leucorrhea, and in low fevers. Dose, from 20 minims to 1 fluidrachm well diluted.

SALICYLIC ACID. Made by treating sodium phenol with carbon dioxide gas. Prevents putrefaction, but is condemned as a food preservative. A valuable remedy in rheumatism and gout. Dose, from 5 to 30 grains.

STEARIC ACID. Obtained from tallow by the action of sulphuric acid. Used for making glycerine suppositories.

SULPHURIC ACID. Obtained by burning sulphur of pyrites and oxidizing the fumes of sulphurous acid gas. Specific gravity is 1.840. A fluidounce weighs slightly more than 14 drachms. It is commonly called oil of vitriol. Rarely used as a caustic.

AROMATIC SULPHURIC ACID (*Acidum Sulphuricum Aromaticum*). Composed of Sulphuric Acid, 111 parts; Tincture of Ginger, 50 parts; Oil of Cinnamon, 1 part; and Alcohol to make 1,000 parts. Contains not less than 20 per cent by weight of sulphuric acid. Tonic, refrigerant, and astringent; used in diarrhœa, cholera, typhoid fever, night sweats, and in lead poisoning. Dose, from 5 to 15 minims well diluted and taken through a glass rod to protect the teeth. Sometimes given as sulphuric acid lemonade.

DILUTED SULPHURIC ACID. Contains 10 per cent of absolute sulphuric acid. Tonic, refrigerant, and astringent. Used in fevers as a tonic to increase the appetite and to aid digestion; as an astringent in night sweats, hemorrhages, and diarrhœa. To be well diluted and taken through a glass tube to protect the teeth. Dose of the diluted acid, 10 to 30 minims.

SULPHUROUS ACID. A liquid containing not less than 6 per cent by weight of sulphur dioxide. A powerful antiseptic and

germicide. As the fumes of burning sulphur it is an important disinfectant.

Tannic Acid. Obtained from nutgall. It is a solid, whitish, or yellowish powder, and is the chief constituent of vegetable astringents. Used in active hemorrhages, diarrhœa, relaxation of the uvula, chronic inflammation of the throat, aphthae, chapped nipples, ulcers, piles, and chilblains. Dose, from 3 to 10 grains.

Tartaric Acid. Usually prepared from argol deposited on the inside of wine casks during fermentation. A cheap and valuable substitute for lemonade. Used in effervescing drinks. Dose, from 5 to 30 grains.

Trichloracetic Acid. Made by oxidizing hydrated chloral with nitric acid. An active caustic used in chronic inflammation of the nose, pharynx, and tonsils in a solution of 1 in 1,000 or 1 in 2,000. Not used internally.

Aconite. Monkshood or Wolfsbane. The dried root of *Aconitum napellus* (Linné), collected in the autumn and must contain not less than 0.5 per cent of aconitine. Aconite root comes from Europe or India. Both root and leaves are used, though the U. S. Pharmacopœia does not recognize the leaves. In the formation of acute inflammation, such as quinsy, pneumonia, pleurisy, rheumatism, erysipelas, aconite is of great value. This remedy is extensively used by all physicians. For breaking up colds and fevers it probably has no superior. It is antipyretic, diaphoretic, diuretic, much used in acute throat affections and inflammation of the lungs and respiratory passages. Dose of aconite root, ½ to 1 grain. Dose of the fluidextract, from ½ to 1 minim, but must be used with great caution, beginning with the smallest dose; of tincture of aconite, from 3 to 10 minims. In the revised pharmacopœia of 1905, the tincture of aconite has been greatly reduced in strength from 35 per cent to 10 per cent. The dose is, therefore, about three times as great as formerly.

Alcohol (*Spirit of wine or rectified spirit*). The result of the fermentation of many vegetables. A wonderful preservative agent. Used in the preparation of tinctures of substances containing a large proportion of resinous properties. Good whiskey, which contains 50 per cent of alcohol, is often used instead of diluted alcohol. Valuable as a heart stimulant in cases of shock, collapse, and heart failure. Absolute alcohol contains not more than 1 per cent of water and has a specific gravity of 0.797 at 60° F. Commercial alcohol contains 91 per cent of absolute alcohol and 9 per cent of water by weight; 92.3 per cent of ethyl alcohol and 7.77 per cent of water by volume. Dilute alcohol contains 41 per cent by weight of absolute alcohol. Methyl alcohol, methylated spirit, is "wood alcohol" and is poisonous. Rectified spirit contains 84 per cent of absolute alcohol. Proof spirit is diluted alcohol (see above). Ethyl alcohol is the ordinary alcohol, sometimes called ethyl hydrate and grain spirit. Amyl alcohol, amyl hydrate, potato spirit, or fusel oil, is derived by continuing the distillation after the pure spirit (ethyl alcohol) has ceased to be given off. Denatured alcohol is ethyl alcohol mixed with some nauseous substance to render it unfit for drinking.

Almond Oil. A demulcent and useful ingredient of prescriptions and preparations, especially to conceal the taste of cod-liver oil and castor oil. The bitter almond oil contains from 2 to 4 per cent of hydrocyanic acid, and is used like the latter. Dose, ¼ of a minim—about ¼ of a drop. Almond oil is obtained only from the bitter almond. Another oil known as the Expressed Oil of Almonds is made from either bitter or sweet almonds. It is used as an emulsion in pulmonary affections with cough.

Aloes. An excellent purgative, does not produce watery stools, nor create wind in the bowels, rarely disagrees with the stomach. In small doses assists digestion. Often used in cases of habitual costiveness in connection with indigestion. Aloes act principally on the lower intestines, and will irritate if given too frequently or in too large doses. Should not be used in cases of piles, except in very small doses, nor when there is inflammation in the bowels, and should be carefully avoided by females who are subject to immoderate flowing of the menses, and carefully avoided during pregnancy. It is emmenagogue and anthelmintic. Dose of the extract or inspissated juice from 2 to 10 grains; average dose, 4 grains. Tincture of Aloes is a solution of 1 in 10 or a 10 per cent solution, the dose of which is from ½ to 1 drachm; average dose, 30 minims. The dose of the tincture of aloes and myrrh is the same as that of the tincture of aloes. Aloes Pill, known as Pill of Barbadoes Aloes, contains 2.01 grains of aloes, and the dose is two or three pills at bedtime. The pill of aloes and asafœtida was not retained in the 8th Revision of the U. S. P. The aloes and iron pill consists of Aloes, 1 grain; Sulphate of Iron, 1 grain; Aromatic Powder, 1 grain; made into a mass with Confection of Roses. Of value as a mild purgative, tonic, and blood builder. The pills of Aloes and Mastic (known as Lady Webster Pills) contain

Aloes, 2 grains; Mastic, .62 grain, and Red Rose, .46 grain. The pill of Aloes and Myrrh contains about 2 grains of Aloes; Myrrh, .93 grain; it is known as Rufus's Pill.

ALOIN. The active principle of aloes. Used in pills as a purgative. Dose, ¼ grain.

ALUM. An astringent, styptic; in 1 drachm doses an emetic; in large doses a purgative. Dried alum is ordinary alum deprived of its water by heat. From 1 to 4 drachms of alum in 5 or 6 ounces of alcohol is an excellent wash to harden the skin and to prevent bedsores. Useful in checking the flow of blood from the nose, gums after extraction of teeth, slight wounds, and sometimes in cases of piles. In nosebleed, powder and blow into the nostrils through a quill. A solution of alum is useful in chronic discharges from the nose, ear, and female genital organs. In these cases use a teaspoonful alum to a pint of water. A gargle of alum water is beneficial in many cases of sore throat, especially when the parts are relaxed and "palate down." Burnt alum will remove proud flesh. Alum is sometimes used internally for diarrhœa and dysentery. Two or three grains dissolved in aromatic syrup, taken three or four times daily, will often do much good in the later stages of whooping cough. Alum is an effective emetic in spasmodic croup. Dose, teaspoonful of powdered alum mixed with same amount of molasses and water; give one third of this quantity every three to five minutes until the desired result is produced.

AMMONIA. A gas with a pungent odor and strongly alkaline properties. The gas dissolved in water in a 10 per cent proportion forms the ordinary ammonia or liquor of ammonia used in medicine and for household cleansing purposes. The stronger solution (known as Aqua Ammonia Fortior and used externally only) contains 28 per cent of the gas. Ammonia compounds are antacid, gastric, and cardiac stimulants, and are used in headache, hysteria, bronchitis, and other lung affections. Dose of ammonia water, from 5 minims to ½ drachm. Used externally as a counterirritant; also in stings and bites of insects.

AMMONIAC. A gum in the form of tears or cakes derived from the *Dorema ammoniacum* of Persia. It is a stimulant expectorant of value in bronchitis and asthma. Dose, 10 to 30 grains.

AMMONIA LINIMENT. Composed of Ammonia Water, 35 parts; Cottonseed Oil, 57 parts; Alcohol, 5 parts; and Oleic Acid, 3 parts. An excellent rubefacient for inflammatory conditions of the throat; catarrhal and chest affections of children; and in rheumatic pains. Applied by rubbing and on flannel.

AMMONIATED MERCURY. White Precipitate. Contains not less than 78 per cent or more than 80 per cent of metallic mercury. Used in ointment in eruptions of the skin, such as psora, porrigo, and herpes.

AMMONIUM BENZOATE. Contains not less than 98 per cent of pure ammonium benzoate. Made from benzoic acid and water of ammonia. Used in urinary derangements and gouty affections. A diuretic. Dose, from 10 to 30 grains.

AMMONIUM CARBONATE. Should yield not less than 31.58 per cent of ammonia gas. Made by subliming ammonium chloride with chalk. A powerful heart stimulant; largely used in pneumonia, bronchitis, and in the last stages of phthisis. With strong ammonia and oil of lavender it forms smelling salts. Dose, 5 to 10 grains.

AMMONIUM CHLORIDE. Sal Ammoniac or Muriate of Ammonia. Obtained from the gas liquor of gas works, and also from the destructive distillation of bone. A stimulant expectorant in acute and chronic bronchitis, and in catarrhal pneumonia. Dose, from 5 to 10 grains.

AMMONIUM IODIDE. Used in chronic rheumatism, incipient phthisis, and scrofulous enlargements. Dose, 3 to 5 grains.

AMMONIUM SALICYLATE. A salt new to the U. S. P. The best of the salicylates for use in rheumatism, being less nauseous and depressing than others. Dose, 10 to 20 grains.

AMMONIUM VALERIANATE. Useful in mild nervous affections, hysteria, chorea, and neuralgia. Dose, 2 to 10 grains.

AMYL NITRITE. An ethereal liquid, having a fruity odor and pungent taste. Increases the heart's action; dilates the capillaries, lowers the blood pressure; prevents spasms, especially in epilepsy, neuralgia of the heart, and malarial chills. It is an antidote in poisoning by chloroform. Dose, from 3 to 5 drops placed on a handkerchief and inhaled. From 6 to 8 drops may be given by the mouth on sugar.

ANISE. A carminative, derived from the *Pimpinella anisum*. Dose, from 10 to 20 grains; dose of the oil of anise, from 2 to 5 drops; of anise water, from 1 to 4 grains; of the spirit of anise, from 1 to 2 drachms. Used to liquefy the bronchial secretions, hence a useful ingredient of cough mixtures. It is also a mild heart stimulant.

ANTIMONY AND POTASSIUM TARTRATE. Tartar Emetic. In small doses of 1-12 of a grain it is diaphoretic and expectorant, often of great service in the earlier stages of bronchitis. In doses of ½ grain it is emetic. In larger doses it is poisonous.

ANTIMONY, WINE OF. Composed of Tartar Emetic, 4 parts; Boiling Water, 65 parts; Alcohol, 175 parts; and White Wine to make 1,000 parts. It thus contains 1.8 grains of tartar emetic to the fluidounce. The wine of antimony makes it possible to easily administer small doses of tartar emetic with certainty. Dose, as an expectorant or diaphoretic, 10 to 30 minims; as an emetic for children, from 30 minims to a fluidrachm, repeated every 15 minutes until effective.

ANTIPYRINE. Phenyldimethylpyrazolon; in the British Pharmacopœia it is known as Phenazone. Made by condensing phenylhydrazine with aceto-acetic ether and methylizing the product. Given in fevers as a very powerful and effective antipyretic, reducing the fever in half an hour; also an analgesic in migraine, rheumatism, and neuritis. It is also sedative, diuretic, and sligthly hæmostatic. Its after effects are decided depression, and, often, a weakened pulse. Dose, from 5 to 15 grains; average dose, 7½ grains in wine, iced brandy, and water. A treacherous drug.

APOCYNUM. Canadian Hemp, Dogsbane, Black Indian Hemp. The dried rhizome of *Apocynum cannabinum* (Linné). Cardiac stimulant, diuretic, and expectorant. In large doses an emetic and drastic purgative. Given in decoction and infusion. The decoction of half an ounce of the root in 1½ pints of boiling water is given in doses of from 1 to 2 fluidounces at intervals. Dose of the fluidextract from 5 to 10 minims; as an emetic, 15 to 20 minims.

APOMORPHINE HYDROCHLORIDE. Apomorphine is an alkaloid prepared from morphine by the abstraction of 1 molecule of water. From 1-15 to 1-10 of a grain injected under the skin of an adult provokes free vomiting in from 5 to 20 minutes. As an expectorant the dose is from 1-20 to 1-16 of a grain; as an emetic, by the mouth, from 1-10 to ¼ of a grain. Under no circumstances is more than ¼ of a grain ever given.

Aquae (*Waters*). Medicated waters are all preparations holding volatile or gaseous substances in solution.

AQUA AMMONIAE OR AMMONIA WATER. Contains 10 per cent by weight of gaseous ammonia dissolved in water. It is stimulant, irritant, or caustic, according to strength. A valuable remedy in sudden syncope.

AQUA AMMONIAE FORTIOR OR STRONGER AMMONIA WATER. Contains 28 per cent by weight of gaseous ammonia dissolved in water.

AQUA AMYGDALAE AMARAE OR BITTER ALMOND WATER. Oil of Bitter Almonds dissolved in water in the proportion of 1 in 1,000. Dose, 1 fluidrachm.

AQUA ANISI OR ANISE WATER. Oil of Anise dissolved in water in the proportion of 1 in 1,000. Used as a vehicle.

AQUA AURANTII FLORUM OR ORANGE FLOWER WATER. Stronger Orange Flower Water and Distilled Water, equal parts. Used as a vehicle and to flavor syrups and elixirs.

AQUA AURANTII FLORUM FORTIOR OR STRONGER ORANGE FLOWER WATER. A saturated solution of the volatile oil of fresh orange flowers.

AQUA CAMPHORAE OR CAMPHOR WATER. Eight grammes of Camphor, 8 cubic centimeters of Alcohol, 8 grammes of Purified Talc, and Water to make 1,000 cubic centimeters. Dose, ½ to 1 fluidounce.

AQUA CHLOROFORMI OR CHLOROFORM WATER. One half per cent of chloroform in water. An excellent vehicle. Dose, ½ to 2 fluidrachms.

AQUA CINNAMOMI OR CINNAMON WATER. Oil of Cinnamon, 2 cubic centimeters; Purified Talc, 15 grammes; Distilled Water to make 1,000 cubic centimeters. A vehicle.

AQUA CREOSOTI OR CREOSOTE WATER. One per cent of creosote in water, or about 4.8 minims of creosote to the fluidounce. A gargle, lotion, or to correct foul odors. Dose, 1 to 4 fluidrachms.

AQUA FOENICULI OR FENNEL WATER. Two cubic centimeters of Oil of Fennel in 1,000 cubic centimeters. A mild aromatic serving as a vehicle for other medicines.

AQUA HAMAMELIDIS OR HAMAMELIS WATER OR WITCH HAZEL WATER. Made from Witch Hazel Bark, Alcohol, and Water.

AQUA HYDROGENII DIOXIDI OR SOLUTION OF HYDROGEN DIOXIDE OR PEROXIDE. Contains about 3 per cent by weight of Hydrogen Dioxide in water. A powerful antiseptic, deodorant, and cleanser of putrid cavities, abscesses, and infected wounds. Dose, 1 fluidrachm (U. S. P.).

AQUA MENTHAE PIPERITAE OR PEPPERMINT WATER. Two cubic centimeters of Oil of Peppermint; 15 grammes of Purified Talc; 1,000 cubic centimeters of water. A vehicle.

Aqua Menthae Viridis or Spearmint Water. Two cubic centimeters of Oil of Spearmint; 15 grammes of Purified Talc; 1,000 cubic centimeters of Water. The mint waters and cinnamon water are the most frequently employed of all vehicles.

Aqua Rosae or Rose Water. Stronger Rose Water and Distilled Water in equal parts. Used in lotions on account of its agreeable odor and the absence of irritating effects.

Aqua Rosae Fortior or Stronger Rose Water. A saturated solution of the volatile oil of rose petals in water. Used in making Rose Water.

Argenti Cyanidum or Silver Cyanide. Used officially in making Hydrocyanic Acid.

Argenti Nitras or Silver Nitrate or Lunar Caustic. In a pure state an escharotic. An aqueous solution, 20 or 30 grains to the ounce, is used in inflammations of the mucous membranes; for an eye lotion in the strength of 1 or 2 grains to the ounce. It is an alterative in certain nervous affections. Dose, ¼ to ½ grain.

Argenti Nitras Fusus or Moulded Silver Nitrate or Lunar Caustic. In the form of moulded pencils of silver nitrate toughened by the action of Hydrochloric Acid. For external use as a stimulant, vesicant, or escharotic. To apply to warts, excrescences, ulcers, etc.

Argenti Nitras Mitigatus or Mitigated Silver Nitrate. One part of Silver Nitrate fused with 2 parts of Potassium Nitrate. Less energetic in outward applications than the fused nitrate.

Argenti Oxidum or Silver Oxide. A substitute for silver nitrate, as it is not escharotic and does not stain the skin to such a degree. Dose, 1 grain.

Arnica. The dried flower heads of *Arnica montana* (Linné); while the flowers, root, and leaves are used, the flowers only are official. Useful in sprains, bruises, etc.; for this purpose a tincture of the flowers has great repute as a household liniment. When given internally, the tincture is given in doses of from 5 to 10 drops repeated every two hours. The tincture of the U. S. P. is twice as strong as that of the British Pharmacopœia. The U. S. tincture is made from the flowers; that of the Br. P. is made from the rhizome.

Aromatic Powder (*Pulvis Aromaticus*). Composed of Cinnamon and Ginger, of each 35 parts; Cardamom and Nutmeg, of each 15 parts. Stimulant and carminative in doses of from 10 to 30 grains. It also forms an excellent spice plaster to be placed over the stomach in cases of nausea.

Aromatic Spirit of Ammonia (*Spiritus Ammoniae Aromaticus*). Composed of Ammonium Carbonate, 34 parts; Ammonia Water, 90 parts; Oil of Lemon, 10 parts; Oil of Lavender Flowers, 1 part; Oil of Nutmeg, 1 part; Alcohol, 700 parts; and Water to make 1,000 parts. Its specific gravity is about 0.900 at 25° C. or 77° F. A stimulant antacid in sick headache, a stomachic, and prevents nausea. Dose, from 30 minims to a fluidrachm well diluted.

Arsenate of Soda (*Sodii Arsenas*). Tonic, alterative, improves nutrition. Useful in anæmia, chlorosis, scrofula, St. Vitus' dance or chorea, malaria, eczema, and chronic skin diseases. Dose of the crystallized salt, 1-10 of a grain.

Arsenic Trioxide or Arsenous Acid (*Arseni Trioxidum*). Called also Arsenous Anhydride, Arsenous Oxide, and White Arsenic. In concentrated form and as a local application it is a violent and somewhat dangerous irritant and escharotic. In medicinal doses internally it is alterative; affects nutrition favorably; useful in nervous debility, chorea or St. Vitus' dance, chronic malaria; stomachic, increases the appetite, improves digestion; in large doses it is a violent poison. Dose of arsenic trioxide, 1-50th to 1-20th of a grain.

Asafoetida. A gum resin obtained from the root of *Ferula foetida* found in Persia and Afghanistan. A powerful stimulant antispasmodic, expectorant, and feeble laxative. Used in hysteria, hypochondriasis, convulsions, spasms of stomach and bowels, whooping cough, asthma, croup, measles, and catarrh. Given in pill in doses of from 5 to 10 grains. The tincture of asafœtida contains 20 per cent of asafœtida. Dose of the tincture, from 30 minims to a fluidrachm.

Aspidium. Male fern. The dried rhizome of *Dryopteris filix mas*. Used among the ancients as a vermifuge. The powdered root contains an oleoresin that is a very efficient agent against tapeworm. Large doses are poisonous. For the expulsion of tapeworm, the patient lives on bread and a little milk for one day preceding a dose of from ½ to 1 fluidrachm of the oleoresin taken in the morning. Dose of the powdered root, from 1 to 2 drachms.

Atropine. An alkaloid obtained from the *Atropa belladonna* and from other plants of the family of *Solanaceae*. A violent poison, to be used with the utmost caution. Useful in spasmodic diseases, whooping cough, asthma, narcotic poisonings, shock, and for

dilating the pupil of the eye. Dose of atropine from 1-200th to 1-100th of a grain.

Atropine Sulphate (*Atropinae Sulphas*). Made by neutralizing atropine with diluted sulphuric acid. Uses the same as those of atropine and belladonna. A 1 per cent solution of atropine sulphate applied to the exposed pulp of a tooth is said to be an instantaneous cure for the toothache. Used largely in dentistry. Dose, from 1-200th to 1-100th of a grain.

Aurantii Amari Cortex or Bitter Orange Peel. The dried rind of the unripe fruit of *Citrus vulgaris.*

Aurantii Dulcis Cortex or Sweet Orange Peel. The recently separated rind of the *Citrus aurantii.* Bitter orange peel is a mild tonic, carminative, and stomachic. The sweet is only aromatic. They are added to preparations of the vegetable bitters, gentian, quassia, calumba, and Peruvian bark.

Balsam of Peru (*Balsamum Peruvianum*). Obtained from the *Toluifera pereirae,* a tree found in Central America, especially in San Salvador (not in Peru). A warm, stimulating stomachic, expectorant used in chronic catarrhs, asthma, phthisis; applied externally to chronic indolent ulcers. It is diffused in water with sugar and yolk of egg. In prescriptions it is suspended by mucilage of acacia. Dose, from 5 to 15 minims.

Balsam of Tolu (*Balsamum Tolutanum*). Obtained from the *Toluifera balsamum* by incisions in the trunk of the tree. It is a feeble stimulant expectorant of agreeable flavor and much used as the basis of cough mixtures. Given in emulsion in doses of from 10 to 30 grains. See Tincture of Tolu.

Belladonna Leaves (*Belladonna Folia*). The dried leaves of *Atropa belladonna.*

Belladonna Root (*Belladonna Radix*). The dried root of *Atropa belladonna.* Belladonna or Deadly Nightshade is a native of Europe and is cultivated in the United States. All parts of it are medicinal. Its uses are the same as those of atropine (which see). Given as extract in the dose of 1 grain. See Tincture of Belladonna and Extract of Belladonna.

Basham's Mixture. Solution of iron and acetate of ammonia (*Liquor Ferri et Ammonii Acetatis*). An active chalybeate and astringent, much used in chronic Bright's disease. Dose from ¼ to ½ fluidounce of the freshly-made preparation. It is double the strength of the former preparation. Contains 4 per cent of the tincture of ferric chloride.

Basilicon Ointment. Rosin Cerate (*Ceratum Resinae*). Composed of Resin, 35 parts; Yellow Wax, 15 parts; and Lard, 50 parts. Much used as an application to blistered surfaces, indolent ulcers, burns, scalds, and chilblains, to which it is gently stimulating. Especially effective on ulcers following burns.

Benzaldehyde. An aldehyde derived from the oil of bitter almonds. It is the artificial oil of bitter almonds. Used as a flavoring agent. It contains no hydrocyanic acid.

Benzoin (*Benzoinum*). A balsamic resin obtained from the *Styrax benzoin* found in Sumatra, Java, Borneo, and adjacent islands. A stimulant expectorant used in lung affections; in bronchitis by inhalation. Dose from 15 to 30 grains. Used chiefly to make benzoic acid. In inhalation the benzoin is dissolved in boiling water and the steam is inhaled. See Tincture of Benzoin.

Benzosulphinide Saccharine (*Benzosulphinidum*). An artificial sweetening substance known popularly as "saccharine" used as a substitute for sugar in diabetes, obesity. Dose from 3 to 5 grains.

Berberis. California Barberry or Holly-Leaf Barberry. The roots and rhizome of the *Berberis aquifolium,* found on both sides of the Rockies. Alterative, laxative, tonic, and diuretic. Used in scrofula, chronic skin diseases, malarial and other fevers, and chronic uterine diseases. Dose, from 20 to 30 grains. See Fluidextract of Berberis.

Betanaphthol. A phenol occurring in coal tar, but made from naphthalene. One of the best agencies for checking fermentative processes in the intestines. Dose, from 2 to 5 grains in capsules.

Bismuth Citrate (*Bismuth Citras*). Contains not less than 56 per cent and not more than 58 per cent of bismuth oxide. Used only for making bismuth and ammonium citrate.

Bismuth and Ammonium Citrate (*Bismuthi et Ammonii Citras*). More rapid, more astringent, and more irritant than the other preparations of bismuth. Dose, from 1 to 3 grains.

Bismuth Oxide. Similar in effects to bismuth subnitrate. Dose, from 10 to 30 grains.

Bismuth Subcarbonate. Similar in effects to bismuth subnitrate. Dose, 10 to 30 grains.

Bismuth Subgallate. Similar to the subnitrate, except that it is, perhaps, more

astringent and therefore more useful in diarrhœa. Dose, 7 to 30 grains.

Bismuth Subnitrate. Very useful in subacute gastritis, gastralgia, pyrosis, and other stomach diseases, irritation of the intestines, diarrhœa, and dysentery. Dose, from 5 to 30 grains.

Bromoform. A liquid resembling chloroform, especially useful in whooping cough, given in extremely small doses, as the drug is highly poisonous. Dose, from 1 to 5 drops in capsules, or on sugar, or in emulsions.

Buchu. The dried leaves of *Barosma betulina,* found in Africa. Very useful in diseases of the urinary organs, especially in gravel, chronic catarrh of the bladder, irritation of the bladder, retention or incontinence of urine. Not to be used when the inflammation is severe. Dose, 1 drachm. See Infusion of Buchu, Tincture of Buchu, and Fluidextract of Buchu.

Caffeine (*Caffeina*). Obtained from the dried leaves of the tea plant, *Thea sinensis,* or from those of the coffee plant, *Coffea arabica.* The amount of caffeine in several kinds of coffee varies from 0.6 to 2.2 per cent. It is a cerebral and cardiac stimulant, and diuretic. Used in somnolence, nervous headache, narcotic poisoning, heart failure, cardiac dropsies, chronic Bright's disease, and sudden collapse. Dose, 1 to 5 grains.

Caffeine Citrate. One of the best forms in which caffeine can be used internally. Dose, from 3 to 8 grains. The effervescent citrate is given in doses of a teaspoonful in water.

Calamus. The dried rhizome of the *Acorus calamus* or Sweet Flag, found abundantly in damp places in the United States. It has a pungent, aromatic taste; used to relieve pain or uneasiness of the stomach or bowels. Also much used in "bitters." Dose of the root, from 20 to 60 grains. Made in an infusion of the strength of 1 ounce to 1 pint of boiling water, it may be taken in doses of from 1 to 2 wineglassfuls. See Fluidextract of Calamus.

Calcium Chloride. Made by treating chalk or marble with hydrochloric acid, evaporating the residue to dryness, and heating to redness. Useful in cases of internal bleeding. Dose, 5 grains three times a day.

Calumba. The dried root of *Jateorrhiza palmata,* found in Africa. A mild, bitter tonic, without astringency; used in derangements of the digestive organs. Dose of the powder, from 10 to 30 grains.

Camphor. Obtained from the *Cinnamomum camphora,* a large evergreen tree found in China, Japan, and other parts of eastern Asia, and in cultivation in many subtropical countries. An antispasmodic in nervous headaches and hysterical conditions; a cardiac stimulant in heart failure, typhoid fever, pneumonia; allays intestinal pain in diarrhœa; a local application in rheumatism, sprains, and bruises. Dose, from 2 to 5 grains. Large doses are poisonous; there is no known antidote for its effects. Monobromated camphor is a substitution product of camphor, and has been used as a nerve sedative.

Camphor Water (*Aqua Camphorae*). Camphor, 8 parts; Alcohol, 8 parts; Purified Talc, 15 parts; Water, to make 1,000 parts. Used as a vehicle for administering other medicines. Dose, from ½ to 1 fluidounce.

Cantharis or Blistering Flies or Spanish Flies. The beetle (*Cantharis vesicatoria*) thoroughly dried; most abundant in Spain, Italy, southern France, and Russia. Used in scaly cutaneous diseases, chronic eczema. They are most frequently used as blistering agents.

Capsicum or Cayenne Pepper. The ripe fruit of the *Capsicum fastigiatum,* cultivated everywhere. A powerful local stimulant; used as a stomach tonic except in ordinary cases of gastric catarrh, also used in cases of neurasthenia. Externally it is a rubefacient. Dose of the powder, from 1 to 10 grains in a pill. See Tincture of Capsicum.

Cardamom. The dried fruit of *Elettaria repens* of Malabar. It is aromatic, carminative, stomachic, and used as a constituent of "bitters." Valuable to prevent purgatives from griping. Dose, from 15 to 30 grains. See Tincture of Cardamom.

Caraway. The dried fruit of *Carum carvi,* found everywhere. A pleasant stomachic and carminative, useful in flatulent colic and as a corrective of other medicines. Dose, 15 to 30 grains.

Cassia, Purging. The dried fruit of the *Cassia fistula,* a large, handsome tree, called Golden Shower in India. Found also in Cochin China, Egypt, Nubia, West Indies, and parts of tropical America. Given in small doses in habitual constipation; in larger doses it causes nausea, flatulence, and griping. Dose of the pulp, 1 or 2 drachms as a laxative.

Cerates. Substances consisting of oil or lard mixed with wax, spermaceti, or resin, to which medicinal agents are frequently added. In consistence, cerates are midway between ointments and plasters. They are

thin enough to spread easily upon muslin, but firm enough to neither melt nor run when applied to the body.

Simple Cerate. White Wax, 30 parts; White Petrolatum, 20 parts; Benzoinated Lard, 50 parts. Used for dressing blisters, wounds, etc., to prevent contact with the air, to keep the parts moist, and to prevent irritation.

Camphor Cerate. Camphor Liniment, 10 parts; White Wax, 35 parts; White Petrolatum, 15 parts; Benzoinated Lard, 40 parts. A slightly stimulating dressing containing 2 per cent of camphor.

Cantharides or Blistering Cerate. Cantharides (Spanish Flies), 32 parts; Liquid Petrolatum, 15 parts; Yellow Wax, 18 parts; Rosin, 18 parts; Lard, 17 parts. It is best spread upon thin leather, though linen or even paper will do. The skin is first moistened with warm vinegar. To obtain the full blistering effects upon adults, it should remain for 8 hours and on the scalp for 12 hours. Upon delicate persons, or when it is desired to produce a quickly healing blister, it should be removed as soon as marked redness of the skin is observed—perhaps in 5 hours or less. From 2 to 4 hours is long enough in the case of children. Follow the cerate with a flaxseed or other soft poultice until the blister forms. The blister should be opened at the lowest or depending part. To heal quickly apply Goulard's Cerate freely.

Cerate of Lead Subacetate or Goulard's Cerate. Solution of Lead Subacetate, 20 parts; Wool-fat, 20 parts; Paraffine, 20 parts; White Petrolatum, 38 parts; Camphor, 2 parts. Used after blisters, in burns, scalds, chilblains, and in all cases of acute, active inflammation of the skin.

Rosin Cerate or Basilicon Ointment. Rosin, 35 parts; Yellow Wax, 15 parts; Lard, 50 parts. Used in blisters, indolent ulcers, burns, scalds, and chilblains.

Compound Rosin Cerate or Deshler's Salve. Rosin, 22½ parts; Yellow Wax, 22½ parts; Prepared Suet, 30 parts; Turpentine, 11½ parts; Linseed Oil, 13½ parts. Used the same as Rosin Cerate.

Cerium Oxalate. A mixture of such rare earths as cerium, didymium, and lanthanum. Used as a remedy for vomiting in pregnancy, and in the gastric disturbances which attend phthisis, uterine disorder, hysteria, dyspepsia, and pyrosis. Dose, 1 grain, repeated three times a day, as a pill or in water.

Cetaceum or Spermaceti. A fatty solid substance obtained from the head of the sperm whale (*Physeter macrocephalus*). The quantity obtained from one sperm whale will fill more than 12 barrels. Used in making ointments.

Chalk, Prepared (*Creta Preparata*). Used principally in medicine for the purpose of checking purging, from acidity of the stomach and bowels. It is mild in action and suited to children. Dose, from 5 to 20 grains. Compound Chalk Powder is made of Prepared Chalk, 30 parts; Acacia, 20 parts; and Sugar, 50 parts. Dose, from 5 grains to 1 drachm. Chalk mixture consists of Compound Chalk Powder, 20 parts; Cinnamon Water, 40 parts; Water, 40 parts. It is much used in diarrhœa. Dose, ½ ounce.

Charcoal (*Carbo Ligni*). Wood-charcoal finely powdered and taken into the stomach, absorbs the gases, and is of great value for dyspepsia, with fetid breath, characterized by flatulence. Dose, 5 to 10 grains, often given with bismuth and pepsin in the form of lozenges. The powder is frequently mixed with flaxseed poultices and applied to gangrenous sores with cleansing results. Foul water may be rendered pure by filtering through charcoal. Charcoal poultice is made as follows: Wood-charcoal, 1 part; Bread Crumbs, 1 part; Linseed Meal, 3 parts; Boiling Water, 20 parts. Charcoal is conveniently prepared in tablets for internal use.

Charta Sinapis or Mustard Paper. Papers to which Black Mustard powder is applied and caused to adhere by a solution of rubber in Carbon Bisulphide. Used instead of the mustard poultice. Can rarely be borne more than 10 or 15 minutes.

Chimaphila. Pipsissewa, Prince's Pine. A diuretic and astringent tonic. The leaves when bruised are used as a rubefacient. Valuable in dropsy, kidney diseases, and affections of the urinary passages. Dose of the decoction, from 1 to 3 ounces. The best preparation is the fluidextract (which see).

Chloral Hydrate (*Chloralum Hydratum*). Hydrated Chloral. It quiets pain and produces sleep lasting about three hours. A powerful hypnotic, antispasmodic, and depressant to the nervous centers. A limited anæsthetic. Used in fevers, in St. Vitus' dance, convulsions, and delirium tremens, and in such cases is superior to opium. Very great caution is to be exercised in its use. Dose, from 5 to 20 grains.

Chloroform. Prepared by mixing and heating chlorinated lime, slaked lime, ethylic alcohol, and water. In small internal doses it is antispasmodic and carminative. Applied externally as a constituent of liniments.

Inhaled with air a valuable general anæsthetic. Its specific gravity is not less than 1.476 at 77° F. It is a counterirritant and narcotic in colic, toothache, and neuralgia. Dose internally, from 5 to 15 minims.

Chrysarobin. Obtained from Goa Powder in the wood of *Vouacapoua araroba*. Used in skin diseases such as psoriasis, chronic eczema; and also in hemorrhoids. Rarely, if ever, used internally.

Cimicifuga. Black Snakeroot. Black Cohosh. The dried rhizome and roots of *Cimicifuga racemosa*. Stomachic, antispasmodic, expectorant, and diuretic. Heart influence same as that of digitalis. Used in heart disease, St. Vitus' dance, and ovarian neuralgia. Dose of fluidextract, from ½ to 1 fluidrachm; of the tincture, from 15 minims to 1 drachm.

Cinchona. Peruvian Bark. Bark derived from the cinchona tree (*Cinchona succirubra*) and several species of cinchona found on the eastern slopes of the Andes. Its active principle is quinine. Astringent, bitter tonic, stomachic, stimulates appetite, promotes digestion, beneficial in malaria. Dose of fluidextract, from 10 minims to 1 drachm. The Infusion of Cinchona is composed of Bark, 6 parts; Aromatic Sulphuric Acid, 1 part; Water, 93 parts. Dose of infusion, from 1 drachm to 1 ounce. The Compound Tincture of Cinchona is composed of Bark, 10 parts; Bitter Orange Peel, 8 parts; Serpentaria, 1 part; Alcohol, 80 parts. Dose, from 1 drachm to ½ ounce.

Cinnamon. The inner bark of the shoots of the *Cinnamomum zeylanicum*, found in Ceylon, China, and Saigon. It is carminative, stimulant, and a flavoring agent. Given in flatulence, colic, neuralgia in stomach and intestines. The oil is inhaled in consumption. Dose of the oil, from 1 to 5 drops on a lump of sugar for flatulent colic and pains in the stomach. Dose of the powder, 10 to 30 grains.

Coca. The fluidextract of a South American tree, the *Erythroxylon coca*, made from the leaves. A tonic. Dose, ½ to 1 drachm.

Cocaine. An alkaloid derived from *Erythroxylon coca*. Stimulant, narcotic, and local anæsthetic. Cocaine habit results in insomnia, loss of mental and moral power, emaciation, and death. The hydrochloride is the salt most used. Dose, internally, from ⅛ to 1 grain. A cerate of 1 part of cocaine to 30 of oil, wax, etc., is used in burns. As a local anæsthetic a solution of from 2 to 8 per cent is used. It is also mixed with oleic acid to form an oleate, and with carbolic acid and vaseline as an application in a strength of from 5 to 10 per cent in catarrhs and rheumatism. A dangerous drug.

Cochineal (*Coccus*). The dried female insect *Pseudococcus cacti* found in Mexico, Central America, and southern Europe. Used to color tinctures and tooth powders and washes.

Codeine. An alkaloid of opium resembling morphine, but weaker in its action. Used in coughs and diabetes. Dose, from ½ to 2 grains. The two salts of codeine, codeine phosphate and codeine sulphate, are similar to codeine in medical properties and are administered in the same doses.

Colchicum. Meadow Saffron. The dried corm of *Colchicum autumnale*. Emetic, diuretic, diaphoretic, and drastic cathartic. Used in rheumatism and acute gout. Dose of the root in powder, from 2 to 8 grains; of the seeds in powder, the same.

Colchicine. An alkaloid obtained from colchicum. Its properties are the same as those of the corm and seed. Dose, from 1-150th to 1-100th of a grain.

Collodion (*Collodium*). Gun Cotton; Pyroxylin. Fibers of cotton treated with combined nitric and sulphuric acid. This solution is then dissolved in ether and alcohol. When these evaporate, there is left a film which is employed as a protective dressing in wounds, abrasions, ulcers, and eruptions on the skin. It is painted on with a soft brush. Also used for holding together the edges of incised wounds, as a treatment for chilblains, and chapped nipples. Blistering collodion is made by the addition of cantharides, and is a convenient blistering agent. Flexible collodion is made by adding Venice turpentine or other agents to collodion to give pliability to the collodion film. Styptic collodion is formed by the addition of tannic acid, which, as an astringent, acts as a means of stopping the bleeding of wounds.

Colocynth. Bitter Apple. The peeled dried fruit of *Citrullus colocynthus* or Bitter Cucumber, a native of Turkey, also found in parts of Asia and Africa. A powerful drastic, hydragogue cathartic used in combination with other drugs. Dose, from 1 to 5 grains.

Confections (*Confectiones*). Soft solid preparations of medicines with which saccharine matter is incorporated.

Confection of Rose (*Confectio Rosae*). Made of Red Rose, 8 parts; Sugar, 64 parts; Clarified Honey, 12 parts; Stronger Rose Water, 16 parts. Used chiefly in the making of pills.

Confection of Senna. Senna, 10 parts;

Cassia, 16 parts; Tamarind, 10 parts; Prune, sliced, 7 parts; Fig, 12 parts; Sugar, 55.5 parts; Oil of Coriander, 5 parts; Water. A very good and pleasant laxative, suited to cases of habitual constipation, pregnant women, and persons with piles. Dose, 1 to 2 drachms at bedtime.

Confection of Sulphur. Sulphur and Potassium Bitartrate are the two laxative ingredients in this preparation. Dose, 1 to 2 drachms.

Conium. Poison Hemlock. Unripe fruit of the *Conium maculatum,* a native of Europe but naturalized in the United States. Poisonous in large doses. Supposed to be the plant used by the Athenians as capital punishment in the cases of Socrates, Phocion, and others. An antispasmodic used in acute mania, delirium tremens, lockjaw, asthma, and whooping cough. Dose, 3 to 5 grains.

Convallaria. Lily of the Valley. The dried rhizome and roots of *Convallaria majalis.* A cathartic, diuretic, and heart stimulant. Poisonous. Dose, 7½ grains.

Copaiba. An oleoresin derived from one of the many species of *Copaiba* of South America. It is gently stimulant, diuretic, and in small doses laxative. It is well suited to diseases of the mucous membranes such as leucorrhœa, chronic inflammation of the bladder, chronic dysentery, diarrhœa, hemorrhoids, chronic bronchitis, and psoriasis. Dose, from 20 minims to a fluidrachm.

Copper Sulphate (*Cupri Sulphas*). Obtained by the interaction of water, sulphuric acid, and metallic copper. Of a rich deep blue color. Irritant and slightly escharotic; and, when diluted, stimulant and astringent. A powerful and prompt emetic in doses of 5 grains. Used as an application to indolent ulcers, warts, and as a styptic to bleeding wounds. As a stimulant wash, it is used in the varying strength of 2, 4 or 8 grains to a pint of water. Used with lime as an insecticide—Bordeaux Mixture—for preventing blight on potato plants.

Coriander. The dried ripe fruit (seeds) of the *Coriandrum sativum,* a native of Italy, but now spreading throughout Europe. It is feebly aromatic, used to conceal the taste of nauseous medicines or to correct their griping properties. Dose, from 20 to 60 grains.

Creosote. A mixture of phenols, guaiacol and creosol, obtained in the destructive distillation of wood. An excellent antiseptic; used in nausea, vomiting, diarrhœa, hysteria, cholera morbus, cholera infantum, typhoid fever, dysentery, menorrhagia, uterine hemorrhage, fetid ulcers, and largely in dentistry. Dose of creosote, from 5 to 10 minims.

Decoctions (*Decocta*). Solutions of the medicinal principles of vegetable drugs, derived by boiling. Decoctions have been largely displaced from the pharmacopœia by reason of their large dose, nauseous taste, repulsive appearance, and poor keeping qualities. They have been largely replaced by tinctures and fluidextracts. The great danger from the indiscriminate use of decoctions arises from ignorance of the proper strength. The physician's advice must be sought as to the quantities to be used in all cases.

Compound Decoction of Aloes (*Decoctum Aloes Compositum*). Made of Extract of Barbadoes Aloes, 1 part; Myrrh, Saffron, and Potassium Carbonate, ½ part each; Extract of Licorice, 4 parts; Compound Tincture of Cardamoms, 30 parts; Water, to make 100 parts. A tonic, cordial, and antacid cathartic, and emmenagogue, used in dyspepsia, habitual constipation, and amenorrhœa. Dose, ½ to 2 fluidounces.

Decoction of Pomegranate Bark (*Decoctum Granati Corticis*). Pomegranate Bark, 20 parts; Water, 80 parts. An astringent, used in diarrhœa, sweats, leucorrhœa, intermittent fever, and as a gargle in sore throat. Dose, ½ to 2 fluidounces.

Decoction of Logwood (*Decoctum haematoxyli*). Logwood in Chips, 5 parts; Cinnamon Bark, 0.8 parts; Water, to make 100 parts. An excellent astringent in diarrhœas of relaxation. Dose for an adult, 2 fluidounces; for a child of two years, 2 or 3 fluidrachms.

Digitalis. Foxglove. The leaves of *Digitalis purpurea.* Used as a powerful heart stimulant and a diuretic. Dose of digitalis leaves, 1 to 2 grains.

Elaterinum. The principle obtained from the juice of the fruit of *Ecballium elaterium,* or squirting cucumber, found in southern Europe. A powerful hydragogue cathartic and diuretic. Used largely in dropsy. Dose, 1-20 to 1-10 of a grain.

Elixirs (*Elixiria*). Aromatic, sweetened, spirituous mixtures, containing active medicinal substances in small quantities.

Aromatic Elixir (*Elixir Aromaticum*). Sometimes called Simple Elixir. Compound Spirit of Orange, 1.2 parts; Syrup, 37.5 parts; Purified Talc, 3 parts; Alcohol, to make 100 parts. Used as a base or vehicle for administering medicines. Sometimes colored with cochineal or caramel.

Adjuvant Elixir (*Elixir Adjuvans*). Fluidextract of Glycyrrhiza, 12 parts; Aromatic Elixir, 88 parts. Used as a vehicle or base for administering and disguising the taste of medicines.

Elixir of Iron, Quinine, and Strychnine Phosphates (*Elixir Ferri, Quininae, et Strychninae Phosphatum*). Soluble Ferric Phosphate, 1.75 parts; Quinine, 0.875 parts; Strychnine, 0.0275 parts; Phosphoric Acid, 0.2 parts; Ammonium Carbonate, 0.9 parts; Alcohol, 6 parts; Acetic Acid, 2.865 parts; Ammonia Water, Water, and Aromatic Elixir, of each enough to make up 100 parts. Dose, 1 to 2 fluidrachms.

Emplastra or **Plasters.** Solid compounds intended for external application; will adhere to the body; and of such a consistency that the preparation must be heated in order to spread it upon leather, linen, or muslin.

Emplastrum Adhesivum or Adhesive Plaster. Made from Lead Plaster to which a little Rubber and Petrolatum are added. Much used for holding the edges of wounds in place and for dressing ulcers.

Emplastrum Ammoniaci cum Hydrargyro or Ammoniacum and Mercury Plaster. Made from Ammoniac, Mercury, Oleate of Mercury, Diluted Acetic Acid, and Lead Plaster. Used in enlargement of the glands, swelling of the joints; and over the liver in chronic hepatitis.

Emplastrum Belladonnae or Belladonna Plaster. Made from 70 parts Adhesive Plaster to which 30 parts Extract of Belladonna Leaves are added. A useful anodyne application in neuralgia and rheumatism.

Emplastrum Capsici or Capsicum Plaster. Made from the Oleoresin of Capsicum and Adhesive Plaster. A rubefacient.

Emplastrum Hydrargyri or Mercury Plaster. Composed of Mercury, Oleate of Mercury, Hydrous Wool-fat, and Lead Plaster. Contains 30 per cent of mercury. A means of introducing mercury into the system.

Emplastrum Opii or Opium Plaster. Made of the Extract of Opium and Adhesive Plaster. For the relief of rheumatic and other pains.

Emplastrum Plumbi or Lead Plaster. Sometimes called Diachylon Plaster. Composed of Soap, Lead Acetate, and Water. Used as an application to excoriated surfaces, slight wounds, and as a protective. Enters largely into the preparation of other plasters.

Emplastrum Saponis or Soap Plaster. Composed of Soap, Lead Plaster, and Water. A discutient often applied to tumors.

Emulsions (*Emulsa*). Liquids which hold oleaginous bodies in suspension in watery fluids, by means of gum or other viscid substances. They are used to render administration of medicines easy, to conceal the bad taste, or to prevent nauseating effects of disagreeable medicines. Their excellence depends entirely upon the intimacy of the mixture.

Emulsion of Almond (*Emulsum Amygdalae*) or Milk of Almond. Sweet Almond, 6 parts; Acacia, 1 part; Sugar, 3 parts; Water, to make 100 parts. Used as a demulcent in catarrhal, dysenteric, and inflammatory conditions. Dose, 2 to 8 fluidounces.

Emulsion of Asafoetida (*Emulsum Asafoetidae*) or Milk of Asafœtida. Asafœtida, 4 parts; Water, 96 parts. Dose, ½ to 1 fluidounce.

Emulsion of Chloroform (*Emulsum Chloroformi*). Chloroform, 4 parts; Expressed Oil of Almond, 6 parts; Tragacanth, 1 part; Water, 89 parts. An agreeable method of administering chloroform. Dose, 2 to 8 fluidrachms.

Emulsion of Cod-Liver Oil (*Emulsum Olei Morrhuae*). Cod-Liver Oil, 50 parts; Acacia, 12.5 parts; Syrup, 10 parts; Oil of Gaultheria, 0.4 parts; Water, to make 100 parts. Sometimes Oil of Bitter Almond is used in place of Oil of Gaultheria. Dose, 2 to 4 fluidrachms.

Emulsion of Cod-Liver Oil with Hypophosphites (*Emulsum Olei Morrhuae cum Hypophosphitibus*). Cod-Liver Oil, 4 parts; Acacia, 12.5 parts; Calcium Hyphosphite, 1 part; Potassium Hypophosphite, 0.5 part; Sodium Hypophosphite, 0.5 part; Syrup, 10 parts; Oil of Gaultheria, 0.4 part; Water, to make 100 parts. Dose, 2 to 4 fluidrachms.

Emulsion of Oil of Turpentine (*Emulsum Olei Terebinthinae*). Rectified Oil of Turpentine, 1.5 parts; Expressed Oil of Almond, 0.5 part; Syrup, 2.5 parts; Acacia, 1.5 parts; Water, to make 100 parts. Dose, 1 to 2 fluidrachms.

Ergot (*Ergota*). A fungus (*Claviceps purpurea*) which grows on rye. It is a stimulant and causes contraction of the involuntary muscles. Controls hemorrhage and causes contraction of the womb. Employed also in night sweats, diabetes, and congestion of the spine. Dose, from 10 grains to 1 drachm.

Ether (*Aether*). An anæsthetic made officially by the action of sulphuric acid on

alcohol (1870); but this is superseded by Squibb's process. Specific gravity, 0.716 to 0.717 at 25° C. or 77° F. Boils at 35.5° C. or 96° F. First used as an anæsthetic in 1846 by Dr. Warren at the Massachusetts General Hospital, on the suggestion of W. T. G. Morton of Boston. Locally a violent irritant. A stimulant antispasmodic in Hoffman's Anodyne. Heart stimulant in heart failure, and a carminative. Internal dose, from 30 minims to 1 fluidrachm in cold water.

Ethyl Chloride (*Aethylis Chloridum*). Prepared by the action of hydrochloric acid on absolute ethyl alcohol. Used to produce local anæsthesia by freezing in dental and surgical cases. Supplied in glass tubes hermetically sealed. From these, when the glass tube is broken, the ethyl chloride streams out upon the part by the force of its own great volatility. Acts as a general anæsthetic, similar to chloroform.

Eucalyptol. A liquid with pungent taste and an odor like that of camphor, derived from an Australian tree (*Eucalyptus globulus*). It is a deodorant, disinfectant, and astringent; applied to wounds, and used also to check discharges; used internally in malarial fever, asthma, and bronchitis; also inhaled in diphtheria and tuberculosis. Dose, 5 to 10 minims in capsule.

Eucalyptus. The dried leaves of *Eucalyptus globulus*, native of Australia, but grown artificially in America. A stimulant expectorant used in the advanced stages of acute and chronic bronchitis, asthma, and genito-urinary inflammations. A local, stimulant, and antiseptic application in skin diseases. Dose, 10 to 30 grains; of the oil, 5 to 10 minims.

Eugenol (*Synthetic Oil of Cloves*). A phenol obtained from oil of cloves and other sources. Medicinal uses are the same as those of the oil of cloves. Dose, 2 to 5 minims.

Euonymus (*Wahoo*). The dried bark of the *Euonymus atropurpureus*, growing in the northern and western states. A laxative and cholagogue, used in dropsy. Dose, 5 to 15 grains.

Eupatorium or Boneset. Also called Thoroughwort. The dried leaves and flowering tops of *Eupatorium perfoliatum*, common in the United States. Tonic, diaphoretic, and in large doses emetic and aperient. Given at the commencement of influenza, muscular rheumatism, or a general cold. Tonic in dyspepsia and general debility. Dose, 20 to 30 grains.

Extracts (*Extracta*). Solid preparations made by evaporating solutions of vegetable principles obtained by solution or by expressing the juice from green plants. They are generally used to administer medicines in pill form.

Extract of Aloes (*Extractum Aloes*). Gives aloes in a purified form. For medicinal properties, see Aloes. Dose, 2 to 10 grains.

Extract of Belladonna Leaves (*Extractum Belladonnae Foliorum*). Contains 1.4 per cent of the alkaloids. Dose, 1-6 to 1-3 of a grain.

Extract of Indian Cannabis (*Extractum Cannabis Indicae*). Formerly called Indian Hemp. Dose, ¼ of a grain.

Extract of Cimicifuga (*Extractum Cimicifugae*). Dose, 3 to 10 grains.

Extract of Colchicum Corm (*Extractum Colchici Cormi*). Dose, ¼ to 1 grain.

Extract of Colocynth (*Extractum Colocynthidis*). Dose, ½ grain.

Compound Extract of Colocynth (*Extractum Colocynthidis Compositum*). Extract of Colocynth, 16 parts; Aloes, 50 parts; Cardamom, 6 parts; Resin of Scammony, 14 parts; Soap, 14 parts; Alcohol, 10 parts. An energetic and safe cathartic; enters into composition of the Compound Cathartic Pill. Dose, as a laxative, 1 to 2 grains; as a purgative, 5 to 10 grains.

Extract of Digitalis (*Extractum Digitalis*). Dose, ¼ grain.

Extract of Ergot (*Extractum Ergotae*). The best preparation of ergot. Dose, 5 to 15 grains.

Extract of Euonymus (*Extractum Euonymi*). The name "euonymin" is often wrongly given to the dried and powdered extract. Dose, 1 to 3 grains.

Extract of Gentian (*Extractum Gentianae*). Dose, 5 to 10 grains.

Extract of Licorice, Extract of Glycyrrhiza (*Extractum Glycyrrhizae*). Made from the root of *Glycyrrhiza glabra*. A useful demulcent, used in cough mixtures; conceals taste of medicines, and gives mass to troches and pills.

Extract of Logwood, Extract of Haematoxylon (*Extractum Haematoxyli*). Made from a decoction. Dose, 10 to 30 grains.

Extract of Hyoscyamus (*Extractum Hyoscyami*). Dose, from 1 to 2 grains.

Extract of Krameria (*Extractum Krameriae*). Called also Extract of Rhatany. Dose, 5 to 20 grains.

Extract of Leptandra (*Extractum Lep-*

tandrae). Called also Extract of Culver's Root. Dose, 5 to 10 grains.

Extract of Malt (*Extractum Malti*). A good emulsifying agent. Dose, 1 to 4 fluidrachms.

Extract of Nux Vomica (*Extractum Nucis Vomicae*). Contains 5 per cent of strychnine. Dose, ¼ to ½ a grain.

Extract of Opium (*Extractum Opii*). Contains 20 per cent of morphine. Dose, ¼ to 1 grain.

Extract of Physostigma (*Extractum Physostigmatis*). Called also Extract of Calabar Bean. Dose, 1-12 to ¼ of a grain.

Extract of Quassia (*Extractum Quassiae*). Dose, 1 to 2 grains.

Extract of Cascara Sagrada (*Extractum Rhamni Purshianae*). Dose, 2 to 8 grains.

Extract of Rhubarb (*Extractum Rhei*). Dose, 2 to 10 grains.

Extract of Scopola (*Extractum Scopolae*). Largely used in the manufacture of Belladonna Plasters. Contains 2 per cent of the alkaloids. Dose, ⅛ to ¼ grain.

Extract of Stramonium (*Extractum Stramonii*). Contains 1 per cent of the alkaloids. Dose, 1-6 to ¼ grain.

Extract of Sumbul (*Extractum Sumbul*). Called also Extract of Muskroot. Dose, 2 to 5 grains.

Extract of Taraxacum (*Extractum Taraxaci*). Called also Extract of Dandelion. Dose, 15 grains to 1 drachm.

Fel Bovis or Oxgall. The fresh bile of *Bos taurus*.

Fel Bovis Purifactum or Purified Oxgall. This formerly occupied a place in medicine but is rapidly passing into disuse. Employed in catarrhal jaundice. Dose, 5 to 20 grains.

Fennel. The dried ripe fruit of *Foeniculum vulgare* cultivated in the gardens of Europe. A grateful aromatic, used as a carminative and as a corrective of senna, rhubarb, and other unpleasant medicines. Dose of the powdered seeds, 20 grains to ½ a drachm.

Ferri Carbonas Saccharatus or Saccharated Ferrous Carbonate. An excellent chalybeate readily soluble in acids. Dose, 5 to 30 minims.

Ferri Chloridum or Ferric Chloride. Sometimes called Iron Perchloride. Used principally to prepare the tincture.

Ferri Citras or Ferric Citrate. A pleasant chalybeate. Dose, 3 to 10 grains.

Ferri et Ammonii Citras or Iron and Ammonium Citrate. A pleasant chalybeate. Dose, 3 to 8 grains.

Ferri et Ammonii Sulphas or Ferric Ammonium Sulphate. Useful in leucorrhœa, and as a styptic on account of its astringency.

Ferri et Ammonii Tartras or Iron and Ammonium Tartrate. A mild chalybeate. Dose, 5 to 10 grains.

Ferri et Potassii Tartras or Iron and Potassium Tartrate. A mild, agreeable chalybeate, of slight astringency, and easily borne by the stomach. One of the best iron preparations for children. Dose, adult, 5 to 10 grains.

Ferri et Quininae Citras or Iron and Quinine Citrate. A tonic combining the properties of both iron and quinine. Dose, 5 to 6 grains three times a day. The Soluble Citrate of Iron and Quinine is employed for the same purpose as the Iron and Quinine Citrate. It is used in the preparation of the Bitter Wine of Iron.

Ferri et Strychninae Citras or Iron and Strychnine Citrate. An efficient tonic, but the doses of the respective agents cannot be varied as might in some cases be desirable. Dose, 3 to 5 grains in pill.

Ferri Hydroxidum or Ferric Hydroxide. The great antidote for arsenic poisoning by rendering arsenic trioxide insoluble, and therefore incapable of being absorbed into the system. For this purpose it is usually mixed with Magnesium Oxide and administered in a dose of 4 fluidounces.

Ferri Hypophosphis or Ferric Hypophosphite. Especially employed in phthisis and anæmic conditions. Dose, 5 to 10 grains.

Ferri Pyrophosphas Solubilis or Soluble Ferric Pyrophosphate. A mild and good chalybeate which is much used because of its ready solubility; it can be administered as pill, simple solution in water, or as a syrup. Dose, 2 to 10 grains.

Ferri Sulphas or Ferrous Sulphate. Called also Copperas. Very astringent; used in hemorrhages, sweats, leucorrhœa and other excessive discharges. A feeble disinfectant. Dose, 2 to 5 grains. Dried Ferrous Sulphate is used for making pills, a form in which the crystallized sulphate is not suited. Granulated Ferrous Sulphate is little liable to oxidation, and is the best form for dispensing the sulphate.

Ferrum Reductum or Reduced Iron. Contains not less than 90 per cent of pure iron. It is one of the best chalybeate tonics,

remarkably free from astringency and yields the largest proportion of iron to the gastric juice. Dose, 1 to 3 grains several times a day.

Fluidextracts (*Fluidextracta*). The most important class of liquid preparations now in use. In 1850 there was only one recognized—the fluidextract of sarsaparilla. Now there are 85 official fluidextracts and a great number of unofficial preparations almost daily increasing. Their advantage consists in concentrating a great quantity of a medicinal agent into small liquid space and of known strength; for each cubic centimeter of fluidextract contains 1 gramme of the crude drug. They are also in convenient form to administer, and, as the evaporation process by which they are made is not carried to the same degree as is required to make solid extracts, there is less danger of injuring the medicinal principles by employing too great heat. By regulation of the 8th Revision of the U. S. P. (1900):—

100 grammes of drug make 100 c.c. of Fluidextract.

100 troy ounces of drug make 105.4 fluidounces of Fluidextract.

100 avoirdupois ounces of drug make 96 fluidounces of Fluidextract.

Fluidextract of Aconite, *Fluidextractum Aconiti.* Dose, ½ to 1 minim.

Fluidextract of Apocynum or of Indian Hemp, *Fluidextractum Apocyni.* Dose, 5 to 10 minims; as an emetic, 15 to 20 minims.

Aromatic Fluidextract, *Fluidextractum Aromaticum.* Dose, 10 to 20 minims.

Fluidextract of Belladonna Root, *Fluidextractum Belladonnae Radicis.* Dose, 1 to 2 minims.

Fluidextract of Berberis, *Fluidextractum Berberis.* Dose, ½ to 1 fluidrachm.

Fluidextract of Bitter Orange Peel, *Fluidextractum Aurantii Amari.* Dose, 15 to 30 minims.

Fluidextract of Buchu, *Fluidextractum Buchu.* Dose, 30 minims to 1 fluidrachm.

Fluidextract of Calamus, *Fluidextractum Calami.* Dose, 5 to 15 minims.

Fluidextract of Calumba, *Fluidextractum Calumbae.* Dose, 15 to 30 minims.

Fluidextract of Indian Cannabis, *Fluidextract Cannabis Indicae.* Dose, 1 to 2 minims.

Fluidextract of Capsicum, *Fluidextractum Capsici.* Dose, ½ to 1 minim.

Fluidextract of Cascara Sagrada, *Fluidextractum Rhamni Purshianae.* Dose, 15 minims to 1 fluidrachm.

Fluidextract of Chimaphila, *Fluidextractum Chimaphilae.* Dose, 1 fluidrachm.

Fluidextract of Chirata, *Fluidextractum Chiratae.* Dose, ½ fluidrachm.

Fluidextract of Cimicifuga, *Fluidextractum Cimicifugae.* Dose, 15 minims to 1 fluidrachm.

Fluidextract of Cinchona, *Fluidextractum Cinchonae.* Dose, 5 to 20 minims.

Fluidextract of Coca, *Fluidextractum Cocae.* Dose, 20 minims to 1 fluidrachm.

Fluidextract of Colchicum Seed, *Fluidextractum Colchici Seminis.* Dose, 2 to 8 grains.

Fluidextract of Conium, *Fluidextractum Conii.* Dose, 3 to 5 minims.

Fluidextract of Convallaria, *Fluidextractum Convallariae.* Dose, 5 to 15 minims.

Fluidextract of Cubebs, *Fluidextractum Cubebae.* Dose, 10 to 40 minims.

Fluidextract of Cypripedium, *Fluidextractum Cypripedii.* Dose, 15 minims.

Fluidextract of Digitalis, *Fluidextractum Digitalis.* Dose, 1 to 2 minims.

Fluidextract of Ergot, *Fluidextractum Ergotae.* Dose, ½ a fluidrachm to ½ a fluidounce.

Fluidextract of Eriodictyon, *Fluidextractum Eriodictyi.* Dose, 15 minims to 1 fluidrachm.

Fluidextract of Eucalyptus, *Fluidextractum Eucalypti.* Dose, 10 to 30 minims.

Fluidextract of Euonymus, *Fluidextractum Euonymi.* Dose, as a laxative, 5 to 15 minims; as a purgative, 1 fluidrachm.

Fluidextract of Eupatorium, *Fluidextractum Eupatorii.* Dose, 20 minims to 1 fluidrachm.

Fluidextract of Frangula, *Fluidextractum Frangulae.* Dose, 10 to 20 minims.

Fluidextract of Gelsemium, *Fluidextractum Gelsemii.* Dose, 2 to 3 minims.

Fluidextract of Gentian, *Fluidextractum Gentianae.* Dose, 10 to 30 minims.

Fluidextract of Geranium, *Fluidextractum Geranii.* Dose, 30 minims to 1 fluidrachm.

Fluidextract of Ginger, *Fluidextractum Zingiberis.* Dose, 10 to 20 minims.

Fluidextract of Glycyrrhiza, *Fluidextractum Glycyrrhizae.* Not given alone.

Fluidextract of Grindelia, *Fluidextractum Grindeliae.* Dose, ½ to 1 fluidrachm.

Fluidextract of Guarana, *Fluidextractum Guaranae.* Dose, 1 to 2 fluidrachms.

Fluidextract of Hamamelis Leaves, *Fluidextractum Hamamelidis Foliorum.* Dose, ½ fluidrachm.

Fluidextract of Hydrastis, *Fluidextractum Hydrastis.* Dose, 15 minims to 1 fluidrachm.

Fluidextract of Hyoscyamus, *Fluidextractum Hyoscyami.* Dose, 5 to 10 minims.

Fluidextract of Ipecac, *Fluidextractum Ipecacuanhae.* Dose, as an expectorant, 1 to 2 minims; as an emetic, 15 to 30 minims.

Fluidextract of Krameria, *Fluidextractum Krameriae.* Dose, 10 minims to 1 fluidrachm.

Fluidextract of Lappa, *Fluidextractum Lappae.* Dose, 30 to 60 minims.

Fluidextract of Leptandra, *Fluidextractum Leptandrae.* Dose, 20 minims to 1 fluidrachm.

Fluidextract of Lobelia, *Fluidextractum Lobeliae.* Dose, as an expectorant, 1 to 5 minims; as an emetic, 10 to 20 minims.

Fluidextract of Lupulin, *Fluidextractum Lupulini.* Dose, 5 to 15 minims.

Fluidextract of Matico, *Fluidextractum Matico.* Dose, ½ to 1 fluidrachm.

Fluidextract of Mezereum, *Fluidextractum Mezerei.* Not used internally.

Fluidextract of Nux Vomica, *Fluidextractum Nucis Vomicae.* Dose, 1 to 3 minims.

Fluidextract of Pareira, *Fluidextractum Pareirae.* Dose, ½ to 1 fluidrachm.

Fluidextract of Phytolacca, *Fluidextractum Phytolaccae.* Dose, as an alterative, 1 to 5 minims; as an emetic, 15 to 30 minims.

Fluidextract of Pilocarpus, *Fluidextractum Pilocarpi.* Dose, 15 minims to ½ fluidrachm.

Fluidextract of Podophyllum, *Fluidextractum Podophylli.* Dose, 5 to 15 minims.

Fluidextract of Pomegranate, *Fluidextractum Granati.* Dose, ½ to 1 fluidrachm.

Fluidextract of Quassia, *Fluidextractum Quassiae.* Dose, 5 to 10 minims.

Fluidextract of Quillaja, *Fluidextractum Quillajae.* Dose, 3 to 10 minims.

Fluidextract of Rhubarb, *Fluidextractum Rhei.* Dose, as a laxative, 5 to 10 minims; as a purgative, 20 to 30 minims.

Fluidextract of Rhus Glabra, *Fluidextractum Rhois Glabrae.* Dose, 10 to 20 minims.

Fluidextract of Rose, *Fluidextractum Rosae.* Dose, 1 to 2 fluidrachms.

Fluidextract of Rubus, *Fluidextractum Rubi.* Dose, ½ to 1 fluidrachm.

Fluidextract of Sanguinaria, *Fluidextractum Sanguinariae.* Dose, 1 to 5 minims.

Fluidextract of Sarsaparilla, *Fluidextractum Sarsaparillae.* Dose, 30 to 60 minims.

Compound Fluidextract of Sarsaparilla, *Fluidextractum Sarsaparillae Compositum.* Dose, 30 minims to 1 fluidrachm.

Fluidextract of Savine. *Fluidextractum Sabinae.* Dose, 3 to 8 minims.

Fluidextract of Squill, *Fluidextractum Scillae.* Dose, 2 to 3 minims.

Fluidextract of Scopola, *Fluidextractum Scopolae.* Dose, 1 to 3 minims.

Fluidextract of Scutellaria, *Fluidextractum Scutellariae.* Dose, ½ to 1 fluidrachm.

Fluidextract of Senega, *Fluidextractum Senegae.* Dose, 5 to 20 minims.

Fluidextract of Senna, *Fluidextractum Sennae.* Dose, ½ to 2 fluidrachms.

Fluidextract of Serpentaria, *Fluidextractum Serpentariae.* Dose, 20 to 30 minims.

Fluidextract of Spigelia, *Fluidextractum Spigeliae.* Dose, 1 to 2 fluidrachms.

Fluidextract of Staphisagria, *Fluidextractum Staphisagriae.* An external application.

Fluidextract of Stillingia, *Fluidextractum Stillingiae.* Dose, 15 to 45 minims.

Fluidextract of Stramonium, *Fluidextractum Stramonii.* Dose, 1 to 2 minims.

Fluidextract of Sumbul, *Fluidextractum Sumbul.* Dose, ½ to 1 fluidrachm.

Fluidextract of Taraxacum, *Fluidextractum Taraxaci.* Dose, 1 to 3 fluidrachms.

Fluidextract of Triticum, *Fluidextractum Tritici.* Dose, 3 to 6 fluidrachms.

Fluidextract of Uva Ursi, *Fluidextractum Uvae Ursi.* Dose, 30 minims to 1 fluidrachm.

Fluidextract of Valerian, *Fluidextractum Valerianae.* Dose, 30 minims to 1 fluidrachm.

Fluidextract of Veratrum, *Fluidextractum Veratri.* Dose, 1 to 2 minims.

Fluidextract of Viburnum Opulus, *Fluidextractum Viburni Opuli.* Dose, ½ to 1 fluidrachm.

Fluidextract of Viburnum Prunifolium, *Fluidextractum Viburni Prunifolii.* Dose, ½ to 1 fluidrachm.

Fluidextract of Wild Cherry, *Fluidextractum Pruni Virginianae.* Dose, 30 minims to 1 fluidrachm.

Fluidextract of White Oak Bark, *Fluidextractum Querci.* Dose, 15 minims to 1 fluidrachm.

Fluidextract of Xanthoxylum, *Fluidextractum Xanthoxyli.* Dose, ½ to 1 fluidrachm.

Frangula or Buckthorn. The dried bark of *Rhamnus frangula,* found in Europe and Russian Asia. An active cathartic like

rhubarb. Dose, 15 to 30 grains of bark, or a tablespoonful of a decoction made of one ounce to the pint.

GAMBIR OR PALE CATECHU. Made from the leaves and twigs of *Ourouparia gambir,* a native of Malacca, Sumatra, Cochin China. A useful astringent in diarrhœa, hemorrhage, relaxation of the uvula, irritation of the fauces, troublesome cough, and spongy gums. Dose, from 10 grains to ½ a drachm.

GELATINE (*Gelatinum*). Derived from skin, ligaments, bones, and other animal tissues treated with boiling water. Used for making capsules. Taken internally it coagulates the blood and is useful in aneurism, hemorrhage, menorrhagia, hemoptysis, hematemesis, and is styptic. Dose, ½ to 1 ounce. Glycerinated Gelatine is made from equal parts of gelatine and glycerine with water to make a jelly used in making suppositories.

GELSEMIUM OR YELLOW JASMINE. The rhizome and roots of *Gelsemium sempervirens,* found in the Southern States. Used in supraorbital neuralgia, dysmenorrhœa, toothache, intermittent and remittent fevers, cardiac palpitations. Dose, 1 or 2 grains; but best administered as fluidextract or tincture.

GENTIAN (*Gentiana*). The rhizome and roots of *Gentiana lutea,* found in mountainous regions of Europe. One of the best tonics of the simple bitters; excites appetite and improves digestion. Used in dyspepsia, gout, amenorrhœa, hysteria, scrofula, and intermittent fevers. Dose, 15 to 30 grains.

GERANIUM OR CRANESBILL. The dried rhizome of *Geranium maculatum,* common throughout the United States. One of our best astringents; used in diarrhœa, chronic dysentery, later stages of cholera infantum, and hemorrhages. Used also as an external application to indolent ulcers; an injection in leucorrhœa; and a gargle in relaxation of the uvula, and ulcerations of the mouth. Given in powder, decoction, tincture, and fluidextract. Dose of the substance, from 15 to 30 grains.

GLYCERINE OR GLYCEROL. A liquid obtained from the decomposition of animal and vegetable fats or fixed oils. It is a triatomic alcohol. A vehicle for other medicines; a laxative; externally as a softening emollient application to the skin.

GLYCERINE OF ALUM (*Glycerinum Aluminis*). Powdered Alum, about 6 parts; Water, about 6 parts; Glycerine, about 88 parts. A good astringent application.

GLYCERINE OF BORAX (*Glycerinum Boracis*). Borax, about 6 parts; Glycerine, about 94 parts. A useful means of applying borax to mouths of children suffering from thrush and other forms of sore mouth. The part is painted with the mixture and covered with raw cotton when practicable.

Glycerites (*Glycerita*). Solutions of medicinal substances in glycerine.

GLYCERITE OF TANNIC ACID (*Glyceritum Acidi Tannici*). Tannic Acid, 20 parts; Glycerine, 80 parts. The most useful preparation of tannic acid for external use; especially good as an application to sore nipples of nursing mothers. Dose internally, 10 to 40 minims.

GLYCERITE OF STARCH (*Glyceritum Amyli*). Starch, 10 parts; Water, 10 parts; Glycerine, 80 parts.

GLYCERITE OF BOROGLYCERINE (*Glyceritum Boroglycerini*). Sometimes called Solution of Boroglyceride. Boric Acid, 31 parts; Glycerine, 69 parts. A very soluble form of antiseptic boric acid.

GLYCERITE OF THE PHOSPHATES OF IRON, QUININE, AND STRYCHNINE (*Glyceritum Ferri, Quininae, et Strychninae Phosphatum*). Soluble Ferric Phosphate, 8 parts; Quinine, 10.4 parts; Strychnine, .08 part; Phosphoric Acid, 20 parts; Glycerine, 50 parts. Used as a convenient method of making the syrup of the phosphates of iron, quinine, and strychnine, by mixing 1 volume of the glycerite with 3 volumes of syrup.

GLYCERITE OF HYDRASTIS (*Glyceritum Hydrastis*). Dose, ½ to 1 fluidrachm.

GLYCERITE OF PHENOL (*Glyceritum Phenolis*). Sometimes called Glycerite of Carbolic Acid. A 20 per cent by volume phenol solution in glycerine. Used internally and externally in a diluted state. Its properties are those of phenol or carbolic acid. Dose, 5 to 10 minims.

GLYCYRRHIZA OR LICORICE ROOT. The rhizome and root of *Glycyrrhiza glabra,* found in Asia Minor, Persia, and India. Cultivated in Europe. An excellent demulcent in pulmonic catarrhs; chiefly used for concealing the taste of disagreeable medicines. The powder is used as a coating for pills.

GRINDELIA. Dried leaves and flowering tops of *Grindelia robusta,* found in the western parts of both Americas. An antispasmodic in asthma, bronchitis, and whooping cough. Also used in chronic catarrh of the bladder. Dose, 30 to 40 grains.

GUAIACOL. One of the principal constituents of creosote. A local irritant with some anæsthetic powers. Less germicidal than

phenol or creosote. Used internally in phthisis and bronchitis; externally in lupus. Dose, 5 to 10 minims.

Guaiacol Carbonate (*Guaiacolis Carbonas*). Differs from guaiacol by its tastelessness and absence of irritant properties. Dose, 15 to 20 grains.

Guaiacum. The resin of the wood of *Guaiacum officinale,* found in many of the West Indies. Stimulant, alterative, laxative, and diaphoretic. Used in rheumatism, gout, scrofula, and skin diseases. Dose, 10 to 30 grains.

Guarana. Dried paste of the crushed seeds of *Paullinia cupana,* found in South America. Used in migraine, and chronic diarrhœa. Dose, 20 to 60 grains.

Haematoxylon or Logwood. The heart wood of *Haematoxylon campechianum,* found in tropical America. A mild astringent without irritating effects. Useful in cholera infantum, chronic diarrhœa, and dysentery. Dose, 10 to 20 grains.

Hamamelidis Cortex or Hamamelis Bark. The bark and twigs of *Hamamelis Virginiana* or Witch Hazel. Dose of leaves or bark, 30 grains.

Hedeoma or Pennyroyal. The dried leaves and flowering tops of *Hedeoma pulegioides.* A gently stimulating aromatic; used in flatulence, colic, and sick stomach. A copious draught of the warm tea at bedtime with a hot foot bath is a popular remedy for suppressed menses. Dose, 2 drachms.

Homatropine Hydrobromide (*Homatropinae Hydrobromidum*). An alkaloid salt possessing many of the properties of atropine. Used in a solution of four grains to the ounce for dilating the pupil. Dose, 1-150th to 1-60th of a grain.

Hops (*Humulus*). The dried strobiles of *Humulus lupulus,* cultivated widely. Tonic, used in dyspepsia, nervous tremors, wakefulness; and fomentations of hops are often helpful in pain. Dose, 30 to 90 grains.

Hydrargyri Chloridum Corrosivum, Bichloride of Mercury or Corrosive Sublimate. A specific in syphilis. Used externally it is stimulant, germicidal, and escharotic. A wash for indolent ulcers and for ringworm. One part of corrosive sublimate in 20,000 of water will kill germs; generally prepared in the form of tablets of calculated strength, so that solutions of any desired strength are easily prepared. One tablet in a half pint of water will make a 1 in 1,000 solution. Dose, 1-100th to ⅛ grain after meals in pill.

Hydrargyri Chloridum Mite, Mild Mercurous Chloride or Calomel. In addition to the general specific properties of mercurials, calomel is purgative and anthelmintic, and is the most valuable of the mercurial preparations. Employed in bilious fevers, hepatitis, jaundice, bilious colic, painters' colic, dysentery, and worms. When given alone it should be followed by a dose of castor oil. Dose as an alterative, ½ to 1 grain; as a purgative, 5 to 15 grains. To a child two or three years old, from 2 to 3 grains as a purge.

Hydrargyri Iodidum Flavum or Yellow Iodide of Mercury. Used in advanced syphilis. Dose, 1-5 of a grain.

Hydrargyri Iodidum Rubrum or Red Iodide of Mercury. Used in scrofula, syphilis, and applied externally to lupus. Dose, 1-20 of a grain.

Hydrargyri Oxidum Flavum or Yellow Mercuric Oxide. Used in local treatment of the eye, usually administered in the form of an ointment or as the Oleate of Mercury.

Hydrargyri Oxidum Rubrum or Red Oxide of Mercury. Known also as Red Precipitate. Used externally as a stimulant or escharotic in cases of indolent or flabby ulcers, in the form of wash or ointment.

Hydrargyrum Ammoniatum or Ammoniated Mercury. Known also as White Precipitate. Used as an external application in the form of ointment.

Hydrargyrum Cum Creta or Mercury with Chalk. A very mild mercurial similar to, but weaker than, blue mass. Used in diarrhœa, and as an alterative in diseases of children. Especially indicated when the stools are of a whitish or clay color. Dose, 1 to 30 grains.

Hydrastine. An alkaloid derived from hydrastis. Used to stop uterine hemorrhage, and menorrhagia; also in catarrhal affections of the mucous membranes. Dose, 1-6 to ½ grain.

Hydrastinine Hydrochloride. The hydrochloride of an artificial alkaloid derived from hydrastine. A cardiac tonic and nerve sedative. Dose, from ¾ to 1½ grains.

Hydrastis or Golden Seal. The dried rhizome and roots of *Hydrastis canadensis,* found throughout the United States and Canada. Used in affections of the mucous membranes, as gastritis arising from alcoholic excesses, hepatic congestion, vomiting of pregnancy; a local application in catarrhal affections of the nose, ear, etc. Dose, 15 to 30 grains. As an application

the proportion varies from half a fluidrachm to 2 fluidrachms to an ounce of the diluent.

Hyoscine Hydrobromide (*Hyoscinae Hydrobromidum*). Used in insomnia from overwork, acute and chronic mania. Dose, 1-120th to 1-60th of a grain.

Hyoscyamine Hydrobromide. The hydrobromide of an alkaloid obtained from hyoscyamus. Properties the same as those of the sulphate. Dose, 1-120th to 1-100th of a grain.

Hyoscyamine Sulphate. The sulphate of an alkaloid obtained from hyoscyamus. Used in acute mania and to dilate the pupil. Similar in effects to atropine. Dose, 1-120th to 1-100th of a grain.

Hyoscyamus or Henbane. The dried leaves and flowering tops of *Hyoscyamus niger,* found in Europe. Used to relieve pain, produce sleep, and to quiet irregular nervous action. Indicated in hysteria, pectoral diseases with cough, in hemorrhoidal troubles, ulcers, rheumatic swellings, and nervous headache. Dose of the leaves, 2 to 5 grains.

Infusions (*Infusa*). Aqueous solutions of vegetable products derived, without boiling, by means of hot or cold water. The substance is either sliced, bruised, or rarely powdered. When energetic or powerful drugs are used, the strength of the infusion must invariably be made upon the advice of a physician.

Infusion of Digitalis (*Infusum Digitalis*). Contains 1½ per cent of bruised digitalis, with cinnamon water as a flavoring ingredient. Dose, 2 to 4 fluidrachms.

Infusion of Wild Cherry (*Infusum Pruni Virginianae*). Contains 4 parts of powdered wild cherry bark. Dose, 2 to 3 fluidounces.

Compound Infusion of Senna or Black Draught (*Infusum Sennae Compositum*). Senna, 6 parts; Manna, 12 parts; Magnesium Sulphate (Epsom Salts), 12 parts; Fennel, 2 parts; Water, 68 parts. An excellent liquid cathartic. Dose, 4 fluidounces.

Iodoform (*Iodoformum*). Obtained by the action of alcohol on iodine in the presence of an alkali or alkali-carbonate. Triiodomethane, antiseptic, anæsthetic, and non-irritant; used in cases of painful ulcers and open cancers; a valuable dressing for wounds. The odor is disagreeable to some patients and may be disguised by oils of peppermint, anise, bergamot, etc.

Iodol (*Iodolum*). Obtained from pyrrol in the presence of alcohol and iodine. Used for all the purposes for which iodoform is used; and may be given internally for tuberculosis of the larynx, laryngitis, scrofula, and diabetes. Dose, 2 to 4 grains.

Iodine (*Iodum*). A non-metallic element contained in sea weeds. Employed as a constituent of several preparations, and used as an application, a bath, an injection into parts, enemata, and by inhalation.

Ipecac (*Ipecacuanha*). The dried root of *Cephaëlis ipecacuanha,* found in Brazil. In large doses, emetic; in smaller doses, diaphoretic and expectorant; in still smaller doses, a stomach stimulant. Used in tropical dysenteries, croup, in the early stages of acute bronchitis, in minute doses in dyspepsia. Dose, emetic, 20 to 30 grains; nauseating, 2 grains; diaphoretic, 1 grain; stomach stimulant, ¼ to ½ grain.

Jalap (*Jalapa*). The dried tuberous root of *Exogonium purga,* found near Jalapa, in Mexico. An active cathartic producing copious watery discharges; used in bilious fevers and congested liver. Dose of powder, 10 to 20 grains.

Kaolin (*Kaolinum*). A native aluminum silicate. Used as an absorbent powder to be dusted upon irritated parts of the body.

Kino. The inspissated juice of *Pterocarpus marsupium,* found on the west coast of Africa. A powerful astringent much used to check morbid discharges; in diarrhœa, chronic dysentery, leucorrhœa, diabetes, and hemorrhages of the uterus and intestines. Dose, 10 to 30 grains.

Krameria or Rhatany. The dried root of *Krameria triandra,* found in South America. Tonic and powerfully astringent; used in chronic diarrhœa, menorrhagia and other hemorrhages; and locally in leucorrhœa, fissure of the anus, and prolapsus ani. Dose of the powder, 20 to 30 grains.

Lactucarium. The concrete milk juice of the *Lactuca virosa* or Strong-scented Lettuce, found in Europe. Anodyne and calming in cough and nervous irritation. Dose, 10 to 20 grains.

Lappa or Burdock Root. The dried root of *Arctium lappa,* abundant on roadsides everywhere. A diuretic and diaphoretic alterative, used in gout, scurvy, scrofula, and some skin diseases. Dose, 30 to 90 grains.

Lard (*Adeps*). The prepared internal fat of the abdomen of the hog (*Sus scrofa* var. *domesticus*). Lard is emollient; but its chief use is as an ingredient of cerates and ointments. Benzoinated Lard (*Adeps benzoinatus*) is often known as Ointment of

Benzoin, and is an effective agent in applying bezoin to the skin.

Leptandra or Culver's Root. The dried rhizome and roots of *Veronica Virginica*, found throughout the United States. A violent cathartic and emetic. Used by eclectics as a cholagogue; also in indigestion and chronic constipation. Dose, 15 to 60 grains.

Lemon Juice (*Limonis Succus*). Derived from the ripe fruit of *Citrus limonum*. Refrigerant, and, when diluted, an agreeable drink in fevers and inflammatory diseases; also used in scurvy and acute rheumatism.

Lemon Peel (*Limonis Cortex*). The outer rind of the ripe fruit of *Citrus limonum*. A useful ingredient of many preparations.

Liniments (*Linimenta*). Preparations intended for external use, and permitting of convenient application by gently rubbing with the hand.

Ammonia Liniment (*Linimentum Ammoniae*). Ammonia Water, 35 parts; Alcohol, 5 parts; Cottonseed Oil, 57 parts; and Oleic Acid, 3 parts. An excellent rubefacient for inflammatory affections of the throat, for catarrhal and other pectoral complaints of children, and for rheumatic pains. Rub well into the part and cover with a piece of flannel saturated in the liniment. Dilute with oil, if too much inflammation results.

Belladonna Liniment (*Linimentum Belladonnae*). Camphor, 5 parts; Fluidextract of Belladonna Root, 95 parts.

Lime Liniment or Carron Oil (*Linimentum Calcis*). Lime Water, 50 parts; Linseed Oil, 50 parts. A very useful liniment in recent burns or scalds. Smear it thickly on lint or cotton batting. Takes its popular name from the Carron iron works in Scotland, where it has been long used.

Camphor Liniment (*Linimentum Camphorae*). Camphor, 20 parts; Cottonseed Oil, 80 parts. An anodyne liniment in sprains, bruises, rheumatism and gout of the joints. Allays the itching caused by cowhage. Camphorated oil is only half the strength—1 in 10.

Chloroform Liniment (*Linimentum Chloroformi*). Chloroform 30 parts; Soap, Liniment, 70 parts. An excellent local application to allay pain. Cover the part with waxed paper or other air-tight material after applying, to prevent the rapid evaporation of the chloroform.

Soap Liniment (*Linimentum Saponis*). Soap, dried and granulated, 6 parts; Camphor, 4.5 parts; Oil of Rosemary, 1 part; Alcohol, 72.5 parts; Water, 16 parts. Much used as an anodyne in sprains, bruises, rheumatic and gouty pains.

Liniment of Soft Soap (*Linimentum Saponis Mollis*). Soft Soap, 65 parts; Oil of Lavender Flowers, 2 parts; Alcohol, 23 parts. Called also Tincture of Green Soap.

Turpentine Liniment (*Linimentum Terebinthinae*). Rosin Cerate, 65 parts; Oil of Turpentine, 35 parts. A valuable remedy for burns and scalds, to be applied as soon as possible after the injury. Should not be continued after the inflammation has subsided.

Linseed or Flaxseed (*Linum*). The ripe seed of *Linum usitatissimum*. Forms an excellent emollient poultice.

Liquores (*Solutions*). Aqueous solutions of medicinal agents without the use of sugar. They differ from infusions in that all of the substance is soluble in liquores; and from waters (*aquae*) in that the dissolved substances are neither gaseous nor very volatile.

Solution of Arsenous Acid (*Liquor Acidi Arsenosi*). Arsenic Trioxide, 1 part; Diluted Hydrochloric Acid, 5 parts; Water, 96 parts. Contains 4.5 grains of arsenous acid to the fluidounce, or 1 per cent of arsenic trioxide. Medicinal properties are the same as those of Fowler's Solution. Dose, 2 to 8 minims.

Solution of Ammonium Acetate, or Spirit of Mindererus (*Liquor Ammonii Acetatis*). Ammonium Carbonate, 5 grammes; Diluted Acetic Acid, 100 cubic centimeters. Contains 7 per cent of ammonium acetate. A feeble diaphoretic. Dose, ½ to 1½ fluidounces.

Antiseptic Solution (*Liquor Antisepticus*). Boric Acid, 2 parts; Benzoic Acid, 0.1 part; Thymol, 0.1 part; Eucalyptol, 0.025 part; Oil of Peppermint, 0.05 part; Oil of Gaultheria, 0.025 part; Oil of Thyme, 0.01 part; Alcohol, 25 parts; Purified Talc, 2 parts; Water, to make 100 parts. A pleasant tasting, feeble antiseptic used as a mouth wash, and as an application to wounds and cuts.

Solution of Arsenous and Mercuric Iodides or Donovan's Solution (*Liquor Arseni et Hydrargyri Iodidi*). An aqueous solution containing 1 per cent of arsenous iodide and 1 per cent of mercuric iodide. An alterative in skin diseases, such as psoriasis, impetigo, porrigo, lepra, pityriasis, lupus; also for the "night pains" of rheumatism. Dose, 1 to 5 minims.

Lime Water or Solution of Calcium Hydroxide (*Liquor Calcis*). A saturated

solution containing not less than 0.14 per cent of pure calcium hydroxide (slaked lime). An antacid, tonic, and astringent; used in dyspepsia accompanied by acidity of the stomach, diarrhœas, and diabetes, nausea, vomiting. Dose, 1 to 4 fluidounces.

Chlorine Water, Compound Solution of Chlorine (*Liquor Chlori Compositus*). Made by saturating water with chlorine gas; contains not less than 0.4 per cent of chlorine. Dose, 1 to 4 fluidrachms.

Compound Solution of Cresol (*Liquor Cresolis Compositus*). An antiseptic solution which mixes with water. Surpasses phenol (carbolic acid) as a germicide or destroyer of micro-organisms. Dose, 1 to 2 minims.

Solution of Ferric Chloride (*Liquor Ferri Chloridi*). An aqueous solution of ferric chloride, containing not less than 29 per cent of the anhydrous salt. A styptic, injected into aneurisms; for stopping hemorrhages. Dose, 1 to 5 minims.

Solution of Iron and Ammonium Acetate, Basham's Mixture (*Liquor Ferri et Ammonii Acetatis*). An active chalybeate and astringent, much used in chronic Bright's disease. Dose, ¼ to ½ fluidounce.

Solution of Ferric Subsulphate, Monsel's Solution (*Liquor Ferri Subsulphatis*). A powerful astringent, styptic; much used in hemorrhage from the stomach or bowels. Dose, 3 to 6 minims, well diluted.

Solution of Ferric Sulphate (*Liquor Ferri Subsulphatis*). A powerful astringent but limited in its uses on account of its marked irritant characteristics. Ferric hydroxide, the great antidote for arsenic is made from it.

Solution of Formaldehyde (*Liquor Formaldehydi*). Contains not less than 37 per cent of weight of absolute formaldehyde. A powerful germicide, higher than phenol (carbolic acid), but lower than corrosive sublimate. Generally used as a disinfecting agent.

Solution of Mercuric Nitrate (*Liquor Hydrargyri Nitratis*). Contains about 60 per cent of mercuric nitrate. A caustic application to cancers, lupus, acne, boils, etc. Never used internally.

Compound Solution of Iodine, Lugol's Solution (*Liquor Iodi Compositus*). Contains not less than 5 per cent of iodine and 10 per cent of iodide of potassium. Medicinally useful for the iodine which it contains. Dose, 5 minims in water or milk to prevent irritation of the stomach.

Solution of Magnesium Citrate (*Liquor Magnesii Citratis*). A cooling cathartic which operates mildly. Dose as a purge, 12 fluidounces; as a laxative, 6 fluidounces.

Solution of Lead Subacetate, Goulard's Extract (*Liquor Plumbi Subacetatis*). Contains not less than 25 per cent of lead subacetate. Astringent, used only externally on sprains, bruises, burns, blisters, etc. Applied on saturated linen cloths, changed as fast as they become dry.

Solution of Potassium Arsenite, Fowler's Solution (*Liquor Potassii Arsenitis*). Contains the equivalent of 1 per cent of arsenic trioxide. Used in intermittent fever, chorea, nervous diseases with debility, malarial affections, and skin diseases. Dose, 3 to 5 minims.

Solution of Potassium Citrate, Neutral Mixture (*Liquor Potassii Citratis*). This effervescing draught is much used in cases of malarial, intermittent, and other fevers attended by marked irritability of the stomach. Dose, 4 fluidrachms.

Solution of Potassium Hydroxide (*Liquor Potassii Hydroxidi*), An antacid, diuretic, and antilithic, formerly much used, but its place is now taken by carbonated alkalies. Dose, 10 to 30 minims.

Solution of Chlorinated Soda, Labarraque's Solution (*Liquor Sodae Chlorinatae*). Applied locally to infected wounds or ulcers, and to cavities which may be reached from the outside. Diluted in such cases with from 15 to 30 parts of water.

Solution of Sodium Arsenate (*Liquor Sodii Arsenatis*). An official form for the administration of sodium arsenate. Dose, 3 to 5 minims.

Solution of Sodium Hydroxide (*Liquor Sodii Hydroxide*). Dose, 10 to 30 minims.

Compound Solution of Sodium Phosphate (*Liquor Sodii Phosphatis Compositus*). Used the same as sodium phosphate. Dose, 1 to 2 fluidrachms.

Solution of Zinc Chloride (*Liquor Zinci Chloridi*). An excellent disinfectant for ships, hospitals, water-closets, etc. Destroys putrid odors, and possesses no odor. A pint is mixed with four gallons of water for disinfecting on a large scale. Applied in weak solution to ulcers and as an injection in inflammatory conditions. Burnett's disinfecting fluid is also an aqueous solution of zinc chloride.

Lithium Benzoate. Made by decomposing lithium carbonate with benzoic acid. A remedy against gout. Dose, 15 to 30 grains.

Lithium Bromide. Introduced into medicine by S. Weir Mitchell. It is more hypnotic than other bromides. Dose, 15 to 30 grains.

Lithium Carbonate. Has an extraordinary solvent power over uric acid in the system. Very valuable in cases of gout and gouty diathesis; also acts as a diuretic. Dose, 5 to 15 grains.

Lithium Citrate. Acts in the same way as lithium carbonate, into which it is changed in the system. Its chief advantage lies in its less unpleasant taste, and less irritating effects upon the stomach. Dose, 10 to 30 grains. The effervescent citrate is a still more agreeable form, and is given in doses of 2 drachms in solution.

Lithium Salicylate. Unites the medicinal properties of lithium and salicylic acid. It is better than salicylic acid in that it is freely soluble in water and less irritating to the stomach. Used effectually in gout and rheumatism. Dose, 20 to 40 grains.

Lobelia. The dried leaves and tops of *Lobelia inflata,* found throughout the eastern states and Canada. Used in spasmodic asthma, catarrh, croup, whooping cough; but chiefly in bronchial spasm. Great caution is necessary in its use. Best given as the tincture. Dose of the plant as an antispasmodic, 5 grains.

Lupulin. Glands derived from the fruit of *Humulus lupulus,* or Hop. See Hops.

Lycopodium. The spores of *Lycopodium clavatum* and other species; known as Club Moss, a native of Europe, Asia, and America. It is a fine, pale yellow powder. Used as a dusting powder on excoriated surfaces, as the chafing of infants; as a coating for pills to prevent adhesion and massing together. It burns with a quick flash when thrown on flame.

Magnesium Carbonate. The official magnesium carbonate of the U. S. P. corresponds very nearly with the Light Magnesium Carbonate (*Magnesii Carbonas Levis*) of the British. It is a very light, white, inodorous powder. Antacid and laxative; used under the name of calcined magnesia in dyspepsia, sick headache, gout, and cases of sour stomach and constipation. Dose as a laxative, 30 grains to 1 drachm; as an antacid or antilithic, 10 to 30 grains. The heavy oxide (*Magnesii oxidum ponderosum*) is also official. Dose, 30 to 60 grains.

Magnesium Sulphate or Epsom Salt. An active and safe cathartic; operates with very little pain or nausea and watery discharges. On account of its cooling and refrigerant effects it is used in fevers, inflammatory affections, colic, and obstinate constipation. The medium dose is 1 ounce. Often combined with senna, as it tends to prevent griping effects of other cathartics. Dose, 1 to 8 drachms. It is also administered as the Effervescing Magnesium Sulphate, a less disagreeable form.

Manganese Dioxide, Precipitated. Tonic and alterative; used in amenorrhœa, chlorosis, scurvy, and some skin diseases, such as itch and porrigo. Also beneficial in stomachic pains of nervous origin. It is superior to bismuth, because it does not constipate. Dose, 3 to 5 grains.

Manganese Hypophosphite. Similar in use to Calcium Hypophosphite (which see). Dose, 3 to 5 grains.

Manganese Sulphate. Tonic, rarely given. Dose, 5 to 20 grains.

Manna. The concrete or solid exudation of *Fraxinus ornus* or Flowering Ash, a native of southern Italy, cultivated elsewhere. A gentle laxative, often prescribed with other purgatives, such as senna, rhubarb, magnesia. Dose for children, 1 to 4 drachms, given in water or an aromatic infusion. Dose, ½ to 1 ounce.

Marrubium or Horehound. The dried leaves and flowering tops of *Marrubium vulgare* or white horehound (hoarhound), a native of Europe but naturalized in America. Tonic, and, in large doses, laxative. Employed in catarrh and chronic affections of the lungs attended with cough and free expectoration. Often given in wineglass doses of an infusion made from 1 ounce of the herb to a pint of boiling water. Dose of the herb, 30 grains to 1 drachm.

Mass of Ferrous Carbonate, Vallet's Mass. A soft pilular mass with a strong iron taste, containing 50 per cent of ferrous carbonate by weight. An excellent preparation in anæmia and chlorosis. Does not deteriorate quickly, is not astringent, and is readily soluble in acids. Dose, in pills, from 3 to 5 grains after meals.

Mass of Mercury, Blue Mass or Blue Pill. One of the mildest of the mercurials; used as a sialagogue and alterative. Dose as a laxative, 5 to 15 grains.

Mastiche or Mastic. A solid resinous exudation of *Pistacia lentiscus,* a native of Mediterranean countries. Scarcely ever given internally except as in the form of Pill of Aloes and Mastic. Used for filling teeth, and applied externally as a styptic in bleeding at the nose, etc.

Matico. The leaves of *Piper angustifolium*, found in the tropics. Feebly astringent and stimulant; effects upon the urinary organs are similar to those of cubebs. Used also in diarrhœa and dysentery, and as a local hæmostatic. Dose, 45 to 75 grains.

Matricaria or German Chamomile. The dried flowers of *Matricaria chamomilla*, a native of Europe, and cultivated in North America. A mild tonic, in very large doses an emetic. Dose, ½ ounce.

Mel or Honey. Used in medicine as a vehicle; especially as a demulcent in gargles. Clarified honey (*Mel depuratum*) enters into composition in several pharmaceutical preparations. Dose, 1 to 4 fluidrachms.

Mel Rosae (*Honey of Rose*). A pleasant addition to gargles for inflammation of the mouth and throat and in ulceration. Dose, 1 fluidrachm.

Mel Boracis (*Honey of Borax*). Borax, 12.5 parts; Glycerine, 6.25 parts; Clarified Honey, 81.25 parts. Used in thrush of infants and in aphthous ulceration of the mouth.

Mentha Piperita (*Peppermint*). The dried leaves and tops of *Mentha piperita*, cultivated extensively. An aromatic stimulant used in nausea, spasmodic pains of the stomach and bowels, flatus, and as an adjuvant to disagreeable and nauseous medicines. Dose, 1 drachm.

Mentha Viridis (*Spearmint*). The dried leaves and tops of *Mentha spicata*, native of Europe, but naturalized throughout America. Medicinally the same as peppermint. Dose, 1 drachm.

Menthol. A secondary alcohol obtained from the oil of peppermint. When the oil of peppermint is cooled to a very low temperature, the menthol crystallizes out. Menthol acts upon the sensory nerves as a paralyzant; is a germicide and resembles phenol (carbolic acid) in its effects. Used externally as a local anæsthetic for the relief of neuralgic pains, toothache, and sciatica; also useful in inflammation of the mouth and throat. Dose, 1 to 2 grains.

Methyl Salicylate. The principal constituent of oil of gaultheria and oil of betula. Similar in effects to the Oil of Gaultheria (which see). Dose, 15 to 30 minims.

Methylthionine Hydrochloride or Methylene Blue. A synthetic dye color obtained from aniline. It is not the same as methyl blue, which is limited to external use as an antiseptic. Methylene blue is absorbed and eliminated by the kidneys coloring the urine blue. A feeble antiseptic employed in urinary diseases; an analgesic in neuralgia; and useful in malaria. Dose in capsule, 2 to 5 grains.

Mezereum. The dried bark of *Daphne mezereum*, a native of Europe and western Asia. The fresh bark is used as a vesicant or epispastic; the dried bark is less powerful. An irritant ointment applied to indolent ulcers is composed of mezereum bark, lard, and yellow wax.

Misturae or **Mixtures.** Preparations of insoluble substances suspended in fluids by the action of gum arabic, sugar, yolk of egg. When oil is used the mixture is more properly an emulsion.

Mistura Cretae or Chalk Mixture. Composed of Compound Chalk Powder, 20 parts; Cinnamon Water, 40 parts; Water, 40 parts. Employed in looseness of the bowels attended by acidity of the stomach. Dose, 4 fluidrachms.

Compound Iron Mixture or Griffith's Mixture (*Mistura Ferri Composita*). A good tonic in debility of the digestive organs, especially when attended by menstrual irregularities; used in hysteria and chlorosis; also in the hectic fever of phthisis and chronic catarrh. Dose, ½ to 2 fluidounces.

Compound Mixture of Glycyrrhiza or Brown Mixture (*Mistura Glycyrrhiza Composita*).

Mixture of Rhubarb and Soda (*Mistura Rhei et Sodae*). Given to children as a stomachic and carminative. Dose, ½ to 1 fluidrachm.

Morphine. An alkaloid obtained from opium, of which it is the chief narcotic principle. It is insoluble in water in its pure state, consequently its soluble salts are preferred. The acetate, sulphate, and hydrochloride are employed and possess similar medicinal effects. Dose, 1-5 of a grain, which is equal to 1 grain of opium.

Morphine Acetate. Identical in medicinal value to the other salts of morphine, and are given by the mouth in pill form; administered hypodermically and applied externally. Dose, ⅛ to ½ grain.

Morphine Hydrochloride. Called Morphine Hydrochlorate in the old edition of the Pharmacopœia. Not used in America so much as are the other salts, but more frequently used in Europe. Dose, ⅛ to ½ grain.

Morphine Sulphate. Dose, ⅛ to ½ grain.

Moschus or Musk. The dried secretion of the preputial follicles of the *Moschus moschiferus* or the musk-deer of the mountainous regions of Central Asia. A stimulant and antispasmodic; valuable in the treatment of nervous exhaustion following the crisis of acute diseases; typhus, typhoid, pneumonia of drunkards, and in obstinate hiccough. Dose, 5 to 15 grains.

Mucilagines (*Mucilages*). An aqueous solution of gum or of gummy substances.

Mucilage of Acacia. Employed chiefly in making pills and in suspending insoluble substances.

Mucilage of Sassafras Pith (*Mucilago Sassafras Medullae*). Much used as an application to the eye in conjunctivitis; also as a demulcent drink in inflammation of the mucous membranes.

Mucilage of Tragacanth. Used in making pills and troches; mixed with glycerine it is an excellent excipient.

Mucilage of Elm (*Mucilago Ulmi*). A demulcent drink in catarrhal and nephritic diseases. An emollient application to boils, carbuncles, and in dermatitis and erysipelas.

Myristica or Nutmeg. The kernel of the ripe seed of *Myristica fragrans,* found in the Moluccas and adjacent islands. It is an aromatic possessing some narcotic properties. It covers the taste of disagreeable medicines. Dose, 5 to 20 grains.

Myrrha or Myrrh. A gum resin obtained from *Commiphora myrrha* of Arabia. A stimulant tonic used in dyspepsia, debility, chronic catarrh, pectoral affections, chlorosis, amenorrhœa, spongy or sore gums, and aphthous sore mouth of children. Dose, 10 to 30 grains.

Naphthalene. A hydrocarbon obtained from coal tar, sometimes called tar camphor. Antiseptic, vermifuge in seat-worms, tænicide in tape-worms, expectorant in chronic bronchitis; used in intestinal catarrh, intestinal inflammation, typhoid fever; externally as an antiseptic dressing, and in the treatment of several skin diseases. Dose in powder, 1 to 3 grains.

Nux Vomica. The dried ripe seeds of *Strychnos nux-vomica,* a tree found in the East Indies. The two principal active principles in the seeds are the alkaloids, strychnine and brucine. Its effects are the same as those of Strychnine (which see). Dose, 1 to 4 grains.

Olea or **Oils.** Oils are liquid or solid substances with the characteristic oily sensation to the touch, are inflammable, and leave a gray or oily stain or trace upon paper. They are classified as Fixed Oils and Volatile Oils.

Fixed Oils are fats or fatty oils which form a large part of the animal and vegetable fats. The vegetable fixed oils are derived almost wholly from the fruits of plants.

1. The *Olive Oil* group includes the vegetable non-drying oils derived from the almond, peach, apricot, bean, earthnut, and the olive.

2. *Rape Oil* group, less non-drying than the oils of Group 1. These are all derived from the *Cruciferae,* and are the oils of colza, rape seed, black mustard, and white mustard.

3. *Cottonseed Oil* group undergoes more or less drying on exposure to the air, and includes beechnut, cottonseed, hazelnut, sesame or teel, sunflower, camelina, and cress seed.

4. *Linseed Oil* group, vegetable drying oils, which are converted in solid masses on exposure to the air. It includes niger seed, hemp seed, linseed, poppy seed, Scotch fir seed, tobacco seed, walnut, and weld seed.

5. *Castor Oil* group is denser and of thicker consistency than other oils. It includes castor, croton, Chinese wood, boiled linseed, and the blown oils.

6. *Palm Oil* group includes such solid vegetable fats as palm oil, cacao butter, nutmeg butter, and shea butter.

7. *Cocoanut Oil* group contains very marked quantities of the glycerides, and includes cocoanut oil, palm-nut oil, laurel oil, Japan wax, and myrtle wax.

8. *Lard Oil* group or animal oleins are fluid at ordinary temperatures and are obtained from terrestrial animals: bone oil, lard oil, tallow oil, and neat's-foot oil.

9. *Tallow Oil* group of solid animal fats such as bone fat, butter fat, butterine, oleomargarine, hog's lard, horse fat, beef tallow, mutton tallow, and wool fat.

10. *Whale Oil* group of marine animal oils derived from fish and whales. Train oil is the class of oils from the whale, seal, shark, cod. Others of the group are cod-liver, menhaden, and porpoise.

11. *Sperm Oil* group, liquid waxes, such as sperm oil, bottlenose oil, and dolphin oil.

12. *Spermaceti* group, waxes proper: beeswax, Brazil wax, Chinese wax, myrtle wax, ocuba wax, palm wax, and spermaceti.

Volatile Oils, distilled oils, or essential oils are found in all odoriferous plants.

The odor is strong, resembling that of the plant from which the oil is obtained; the taste is pungent, and, when diluted, often agreeably aromatic. The greater number of volatile oils are lighter than water. They are classified into:—

1. Alcohols and their esters.
2. Aldehydes.
3. Ketones.
4. Acids and their esters.
5. Phenols and Phenol Ethers.
6. Neutral Bodies, Oxides, etc.
7. Sulphides and Sulphur Compounds.

Oleum Adipis or Lard Oil. A fixed oil expressed at a low temperature from lard. Used wholly for pharmaceutical purposes.

Oleum Aetherium or Ethereal Oil. A volatile liquid consisting of equal parts of heavy oil of wine and ether. Used in the preparation of Compound Spirit of Ether.

Oleum Amygdalae Amarae or Oil of Bitter Almonds. A volatile oil obtained from bitter almond seeds. Used to conceal the disagreeable taste of cod-liver and castor oil. Dose, ¼ to 1 minim.

Oleum Amygdalae Expressum or Expressed Oil of Almond. A fixed oil expressed from the seeds of bitter or sweet almond. Used the same as olive oil; as demulcent in pectoral troubles with cough; forms an agreeable emulsion. Dose, 1 fluidrachm to 1 fluidounce.

Oleum Anisi or Oil of Anise. A volatile oil distilled from anise fruit. Dose, 3 to 5 minims.

Oleum Aurantii Corticis or Oil of Orange Peel. A volatile oil expressed from the fresh peel of the orange. Used only for flavoring purposes. Dose, 3 to 5 minims.

Oleum Betulae or Oil of Betula or Oil of Sweet Birch. A volatile oil derived by distillation from the bark of *Betula lenta* or Sweet Birch. It is generally sold as the oil of wintergreen (oil of gaultheria), from which it differs very slightly. Dose, 5 to 30 minims.

Oleum Cadinum or Oil of Cade or Oil of Juniper Tar. Obtained by dry distillation from the heart-wood of *Juniperus oxycedrus,* found in Mediterranean countries. Used locally in chronic eczema, psoriasis, and other skin diseases. Rarely used internally, its effects resembling those of oil of tar. Dose, 1 to 3 minims.

Oleum Cajuputi or Oil of Cajuput. A volatile oil distilled from the fresh leaves of *Melaleuca leucadendron,* found in the Moluccas and adjacent islands. Prescribed internally in chronic rheumatism, spasmodic affections of the stomach and bowels without inflammation, cholera, low fevers, toothache, dyspepsia, chronic laryngitis, and bronchitis, catarrh of the bladder, skin diseases, especially acne rosacea. Dose, 3 to 10 minims.

Oleum Cari or Oil of Caraway. A volatile oil distilled from the seeds of *Carum carvi.* Used to cover the taste of disagreeable and nauseating medicines, and to prevent griping effects of purgatives. Dose, 1 to 10 minims.

Oleum Caryophylli or Oil of Cloves. A volatile oil distilled from cloves. A powerful local narcotic used for toothache; resembles phenol in its therapeutical effects; used as an antiseptic and antipyretic. Dose, 2 to 6 minims.

Oleum Chenopodii or Oil of Wormseed. A volatile oil distilled from *Chenopodium anthelminticum.* Used as an anthelmintic; given morning and evening for three or four days and followed by a cathartic. Dose, 2 to 6 minims.

Oleum Cinnamomi or Oil of Cinnamon or Oil of Cassia. A volatile oil distilled from Cassia cinnamon. Cordial and carminative without astringency; used to correct or conceal the disagreeable qualities of other medicines. Dose, 1 to 3 minims.

Oleum Copaibae or Oil of Copaiba. A volatile oil distilled from Copaiba. Effects are the same as those of Copaiba. Dose, 5 to 15 minims.

Oleum Coriandri or Oil of Coriander. A volatile oil distilled from Coriander. A correcting and concealing adjuvant. Dose, 3 minims.

Oleum Cubebae or Oil of Cubeb. A volatile oil distilled from Cubeb. Dose, 5 to 15 minims.

Oleum Erigerontis or Oil of Erigeron. A volatile oil distilled from *Erigeron canadense.* Used by eclectics in diarrhœa, dysentery, hemorrhages, hæmoptysis, diarrhœa of debility, and hemorrhage of the bowels in typhoid fever. Dose, 10 minims to ½ fluidrachm.

Oleum Eucalypti or Oil of Eucalyptus. A volatile oil distilled from the fresh leaves of Eucalyptus. Dose, 10 to 15 minims.

Oleum Foeniculi or Oil of Fennel. A volatile oil distilled from Fennel. Dose, 3 to 5 minims.

Oleum Gaultheriae or Oil of Wintergreen. A volatile oil distilled from the leaves of *Gaultheria procumbens.* Used for

its flavor, as a substitute for salicylic acid. Dose, 15 to 30 minims.

Oleum Gossypii Seminis or Cotton-seed Oil. A fixed oil expressed from the seeds of *Gossypium herbaceum*. Used as an adulterant of olive oil, and in many liniments. Dose, 2 to 6 fluidrachms.

Oleum Hedeomae or Oil of Penny-royal. A volatile oil distilled from the leaves and flowering tops of *Hedeoma*. Used in flatulent colic, sick stomach, amenorrhœa, and as a corrective. Dose, 2 to 10 minims.

Oleum Juniperi or Oil of Juniper. A volatile oil distilled from the fruit of *Juniperus communis*. Stimulant, carminative, diuretic, and useful in dropsy. Holland gin owes its properties to this oil. Dose, 5 to 15 minims.

Oleum Lavandulae Florum or Oil of Lavender Flowers. A volatile oil distilled from the fresh flowering tops of *Lavandula officinalis*. Dose, 1 to 6 minims.

Oleum Limonis or Oil of Lemon. A volatile oil expressed from fresh Lemon Peel. Has stimulant and aromatic properties, but chiefly used as a flavoring agent. Dose, 3 to 6 minims.

Oleum Lini or Linseed Oil. A fixed oil expressed from Linseed. Laxative in the dose of a fluidounce. Two fluidounces of the oil night and morning are recommended for piles. Dose, 1 to 2 fluidounces.

Oleum Menthae Piperitae or Oil of Peppermint. A volatile oil distilled from the fresh or partly dried leaves and flowering tops of Peppermint. Stimulating, carminative; used in flatulence, nausea, spasmodic pains in stomach and bowels. An external remedy for neuralgia of great value when applied on a saturated cloth. A useful anodyne counterirritant in rheumatism. Dissolved in alcohol it is known as Essence of Peppermint. Dose, 2 to 10 minims.

Oleum Menthae Viridis or Oil of Spearmint. A volatile oil distilled from the fresh or partly dried leaves and flowering tops of Spearmint. Its uses are the same as those of Peppermint. Dose, 2 to 6 minims.

Oleum Morrhuae or Cod-Liver Oil. A fixed oil obtained from the fresh livers of *Gadus morrhua*. Used in rheumatism, strumous diseases, scrofula, diseases of the joints, carious ulcers, rickets, phthisis, cutaneous diseases, and of supreme value in pulmonary consumption. Dose, 4 fluidrachms.

Oleum Myristicae or Oil of Nutmeg. A volatile oil distilled from nutmeg. Dose, 5 to 10 minims.

Oleum Olivae or Olive Oil. A fixed oil expressed from the ripe fruit of *Olea Europoea*. Nutritious, mildly laxative, valuable in large doses in gallstones; a constituent of ointments, liniments, cerates, and plasters. Dose as a laxative, 1 to 2 fluidounces.

Oleum Picis Liquidae or Oil of Tar. A volatile oil distilled from tar. Dose, 1 to 5 minims.

Oleum Pimentae or Oil of Pimenta or Allspice. A volatile oil distilled from Pimenta. A stimulant aromatic oil. Dose, 3 to 6 minims.

Oleum Ricini or Castor Oil. A fixed oil expressed from the seed of *Ricinus communis*. A mild, speedy cathartic operating with slight uneasiness; valuable in constipation, colic, diarrhœa, dysentery, enteritis; the best and safest cathartic for children. Dose for an infant, 1 to 3 or 4 fluidrachms (relatively larger than for adults); for adults, from ½ an ounce to 2 fluidounces.

Oleum Rosae or Oil of Rose. A volatile oil distilled from the fresh flowers of *Rosa damascena*. Called also the attar, otto or essence of roses. Prepared on a large scale in Turkey. A grateful perfume; added to many preparations, cerates, and ointments.

Oleum Rosmarini or Oil of Rosemary. A volatile oil distilled from the fresh flowers of *Rosmarinus officinalis*. Sometimes adulterated with oil of turpentine. A stimulant, but chiefly used as an ingredient of rubefacient liniments. Dose, 3 to 6 minims.

Oleum Sabinae or Oil of Savine. A volatile oil distilled from the fresh tops of Savine. A powerful local irritant; used as a cure for alopecia in the strength of 5 to 30 minims in 1 ounce of alcohol rubbed on the head.

Oleum Santali or Oil of Sandalwood. A volatile oil distilled from the wood of *Santalum album*. A perfume; a useful remedy for chronic inflammation of the mucous membranes in bronchitis. Dose, 15 to 20 minims.

Oleum Sassafras or Oil of Sassafras. A volatile oil distilled from the root and root bark of *Sassafras variifolium*. Used as a flavoring agent; has medicinal properties similar to those of oil of cloves and other aromatic oils. Dose, 3 to 6 minims.

Oleum Sinapis Volatile or Volatile Oil of Mustard. A volatile oil distilled from Black Mustard seed. Used in making sinapisms (mustard papers for counter-irritants). Never given internally.

Oleum Terebinthinae or Oil of Turpentine. A volatile oil distilled from turpentine and commonly called Spirits of Turpentine. A stimulant, diuretic, diaphoretic, anthelmintic, in large doses cathartic; externally, rubefacient. Dose, 5 to 30 minims.

Oleum Theobromatis or Cacao Butter. A fixed oil expressed from the roasted seeds of *Theobroma cacao*. An ingredient of cosmetic ointments, also used for coating pills and for making suppositories.

Oleum Thymi or Oil of Thyme. A volatile oil distilled from the leaves and flowering tops of *Thymus vulgaris*. An inferior oil made from wild thyme is called Oil of Origanum. An antiseptic, and a diffusible stimulant in collapse. Dose, 3 to 5 minims.

Oleum Tiglii or Croton Oil. A fixed oil expressed from the seeds of *Croton tiglium*, a small tree or shrub found native in Hindostan, Ceylon, the Moluccas. A powerful drastic purgative, acts with great rapidity, frequently within an hour from taking, and with much discomfort. A drop placed upon the tongue of an insensible person will generally operate. Used in obstinate constipation. Applied externally in rheumatism, neuralgia, laryngeal and pulmonary diseases, but must be greatly diluted. Applied to the skin it produces inflammation of the parts, and sometimes acts as a blistering fluid. Dose, ½ to 2 minims.

Opium. The solid exudation obtained from the unripe capsules of *Papaver somniferum* of India. A stimulant narcotic producing sleep in half an hour after a dose is taken. Under its influence pain is allayed and nervous irritation ceases. In its first effects it is an excitant, and is given in low fevers and typhoid fever; opium is also the most effectual analgesic, and is given by mouth or as a hypodermic injection of one of its salts; in sleeplessness due to pain it is one of the most useful drugs of its kind; as an antispasmodic it is beneficial in lockjaw, colic, and convulsions; it allays cough, nausea, and stops internal hemorrhages; it checks the discharges of diarrhœas and diabetes; with ipecac it acts as a diaphoretic in colds, rheumatism, grippe, etc. Dose, 1 to 2 grains.

Pancreatin. Obtained from the pancreas of the hog or ox. It is used as a ferment in dyspepsia, and as a means of a predigesting food. Dose, 7½ to 15 grains.

Paraffine. A solid mixture of hydrocarbons obtained from the distillates of petroleum. It is used in the manufacture of candles; as a preservative of meats and preserves; as a basis of chewing gum, and for coating pills.

Paraldehyde. Obtained from aldehyde by the action of acids or some salts. A mild hypnotic in insomnia of neurasthenia; and of use in asthma. Dose, ½ to 1½ fluidrachms.

Pareira. The dried root of *Chondrodendron tomentosum*, found in Brazil. Tonic, aperient, and diuretic; useful in calculous affections, chronic inflammation of the kidneys and bladder, leucorrhœa, dropsy, rheumatism, and jaundice. Dose, 30 to 60 grains.

Pelletierine Tannate. A mixture of the tannates of four alkaloids found in *Punica granatum*. A useful medicine in cases of tape-worm. Dose, 4 grains.

Pepo or Pumpkin Seed. The ripe seed of *Cucurbita pepo* or common pumpkin. It is given in cases of tape-worm. The patient takes a light supper of bread and milk; in the morning an ounce and a half of the seeds, with no food until 10 a. m. Dose, 1 to 2 ounces.

Pepsin. A ferment obtained from the fresh stomach of the hog. Used in cases of indigestion. Dose, 10 to 15 grains.

Petrolatum or Vaseline. A mixture of hydrocarbons obtained from the residue of petroleum after the lighter and more volatile constituents have been distilled off. It has a number of trade names, such as Petroleum Jelly, Cosmoline, Petroleum Ointment, etc. A bland protective dressing, an ingredient of ointments, and given internally to soothe irritations in 3-grain pills. In doses of from 1 to 4 drachms it acts as a laxative and emollient. White petrolatum is colorless. Liquid petrolatum is called albolene, and glycoline, and is used as a soothing application to the mucous membrane of the nose, throat, and larynx by means of an atomizer.

Phenol or Carbolic Acid. Obtained by fractional distillation from coal tar or made synthetically. A powerful irritant and local anæsthetic; a fatal and rapidly acting poison. It may be given internally for nervous vomiting and diarrhœas of irritation. Externally it is a germicide of service in cases of infection and in antiseptic surgery. A 2 per cent solution is applied to burns, ulcerations, infected wounds, carbuncles, boils, and glandular swellings. The same strength is useful in sanitary disinfection. In burns and scalds 1 part of phenol and 6 parts of olive oil may be applied with lint. Dose internally, 1 to 3 grains.

PHENYL SALICYLATE. Used in typhoid fever, fermentative dyspepsia, rheumatism. Dose, 5 to 15 grains.

PHOSPHORUS. Used as a nerve stimulant in loss of vigor and mental powers, in softening of the brain, neuralgia, melancholia, chronic eczema, and other affections of the skin. Dose, 1-100th to 1-80th of a grain.

PHYSOSTIGMA OR CALABAR BEAN. The ripe seeds of *Physostigma venenosum,* found in West Africa, India, and Brazil. Used in lockjaw, strychnine poisoning, constipation, loss of tone of the bowels, and chronic bronchitis. Dose, 3 grains.

PHYSOSTIGMINE SALICYLATE. Has the medicinal properties of Physostigma. Given as subcutaneous injections to horses in colic. Dose, 1-80th to 1-30th of a grain.

PHYSOSTIGMINE SULPHATE. Uses and dose the same as of the salicylate.

PHYTOLACCA OR POKE ROOT. The dried root of *Phytolacca decandra,* found in all parts of the United States. Used as an emetic, purgative, and narcotic. Does not act as an emetic until from one to two hours after taking, and is very severe in its effects. Used in chronic rheumatism, granular conjunctivitis, cancer, and, as an ointment in skin diseases. Dose as an alterative, 1 to 5 grains; as an emetic, 10 to 30 grains.

PILOCARPINE HYDROCHLORIDE. The hydrochloride of an alkaloid obtained from Pilocarpus, to which it is superior on account of its less disagreeable taste and in the greater certainty of its diaphoretic effect. Capsules or gelatine lozenges containing the hydrochloride allowed to dissolve slowly in the mouth are recommended for the dryness of mouth and throat caused by phthisis. Dose, ⅛ to ¼ of a grain.

PILOCARPINE NITRATE. Medicinal properties and dose the same as of Pilocarpine Hydrochloride.

PILOCARPUS OR JABORANDI. The leaflets of *Pilocarpus jaborandi,* occurring in South America. A diaphoretic much used in dropsy, uræmia, rheumatism, coryza, influenza, Bright's disease. Dose, 20 to 60 grains.

Pills or **Pilulae.** Globular masses of a size small enough to be swallowed. This is the most convenient method of administering medicines of disagreeable taste which may be given in small doses. There are some medicinal substances which may be made into pills of themselves, but the greater number require some other substances to give them the proper consistency, and such substances are called excipients. Pills are coated with substances usually in powder form to prevent them from massing together, such as licorice powder, lycopodium powder, rice flour or starch. Occasionally pills of particularly disagreeable ingredients are sugar-coated. Compressed tablets are used to an enormous extent, and are displacing not only pills but also many compounds of medicine formerly given in liquid form.

PILLS OF ALOES (*Pilulae Aloes*). Consist of Aloes (of which each pill contains 2 grains); Soap, used as an excipient; and Water. An excellent laxative in habitual costiveness. Dose, 1, 2, or 3 pills at bedtime.

PILLS OF ALOES AND MASTIC OR LADY WEBSTER PILLS (*Pilulae Aloes et Mastiches*). Consist of Aloes, 2 grains to each pill; Mastic, 0.31 grains to a pill; Red Rose; and Diluted Alcohol. The mastic probably renders the pill less soluble and delays its full effect until it reaches the lower bowel. Dose as a laxative, one pill at bedtime or before a meal.

PILLS OF ASAFOETIDA (*Pilulae Asafoetidae*). Consist of Asafœtida, 3 grains to a pill; Soap and Water. Disguises the offensive taste and odor of asafœtida. Dose, 1 to 3 pills.

COMPOUND CATHARTIC PILLS OR ANTIBILIOUS PILLS (*Pilulae Catharticae Compositae*). Consists of Compound Extract of Colocynth, Mild Mercurous Chloride, Resin of Jalap, Gamboge, and Alcohol. Each pill weighs 3 grains, of which 2.70 grains are of active ingredients. One pill is a mild laxative; a full dose acts vigorously, generally without discomfort. Used in bilious fevers, hepatitis, and jaundice. Dose, 1 to 3 pills.

VEGETABLE CATHARTIC PILLS (*Pilulae Catharticae Vegetabiles*). This is a cathartic pill without mercury. The effect is the same as the Compound Cathartic. Dose, 1 to 3 pills.

PILLS OF FERROUS CARBONATE OR BLAUD'S PILLS (*Pilulae Ferri Carbonatis*). Contain Ferrous Carbonate and Potassium Sulphate as a result of double decomposition. Dose, 2 to 6 pills, taken three times a day.

PILLS OF FERROUS IODIDE (*Pilulae Ferri Iodidi*). Each pill contains about 1 grain of Ferrous Iodide and 2-5 of a grain of Reduced Iron. Dose, 1 to 3 pills.

COMPOUND LAXATIVE PILLS (*Pilulae Laxativae Compositae*). Contains 1-5 grain of Aloin, 1-130th grain of Strychnine, ⅛ grain

of Extract of Belladonna Leaves, 1-16 grain of Ipecac, and ¾ grain of Powdered Licorice Root. Known also as Pill Lapatic, A. B. S. Pills, and Evacuant Pills. Dose as a laxative, 1 or 2 pills at night.

Pills of Opium (*Pilulae Opii*). Each pill contains 1 grain of Powdered Opium with soap as an excipient. Dose, 1 pill.

Pills of Phosphorus (*Pilulae Phosphori*). Each pill contains about 1-100th grain of phosphorus in the free state. Dose, 1 pill.

Pills of Podophyllum, Belladonna, and Capsicum (*Pilulae Podophylli, Belladonnae, et Capsici*). Each pill contains ¼ grain of Resin of Podophyllum, ⅛ grain of Extract of Belladonna Leaves, ½ grain of Powdered Capsicum. An excellent form by which to secure the laxative effect of podophyllum. Dose, 1 or 2 pills.

Compound Pills of Rhubarb (*Pilulae Rhei Compositae*). Each pill contains 2 grains of Powdered Rhubarb, about ¾ of a grain of Aloes. An excellent warm tonic laxative, useful in costiveness. Dose, 2 to 4 pills.

Pimenta or Allspice. The dried ripe fruit of *Pimenta officinalis,* found in the West Indies, Mexico, and South America. An aromatic spice added to tonics and purgatives. Sometimes used in cases of flatulence. Dose, 10 to 40 grains.

Piper or Black Pepper. The dried unripe fruit of *Piper nigrum,* found in the East Indies. A warm carminative stimulant. Dose, 5 to 20 grains.

Piperine (*Piperina*). A weak basic substance obtained from the Pepper and other plants. Its uses are the same as those of Pepper. Dose, 3 to 5 grains.

Pix Liquida or Tar. Obtained by the destructive distillation of the wood of *Pinus palustris* of the South Atlantic states. Used in chronic catarrhal affections, diseases of the urinary passages; its vapor inhaled is helpful in bronchitis and phthisis; and is a useful application in some skin diseases. Dose, 5 to 20 grains.

Podophyllum, May-Apple or Mandrake Root. The dried rhizome of *Podophyllum peltatum.* A slow but active and certain cathartic used in bilious fevers and in diseases of the liver. The powdered root is not given, the resin, podophyllum, being preferred. Dose of the resin, ⅛ to ¼ grain; as a purgative, ¼ to ½ grain.

Potassii Acetas or Potassium Acetate, A diuretic in doses of from 20 grains to 1 drachm; a mild cathartic in doses of from 3 to 4 drachms. Used in dropsy, skin diseases, and in rheumatism. Dose, ½ drachm to ½ ounce.

Potassii Bicarbonas or Potassium Bicarbonate. Similar in medicinal effects to the carbonate; its taste, however, is milder, and the salt is easily borne by the stomach. Dose, 10 grains to 1 drachm.

Potassii Bitartras, Potassium Bitartrate or Cream of Tartar. A very mild, saline cathartic; an active, soothing hydragogue diuretic. Much used in dropsy, and often given with senna, sulphur, or jalap. Also a refrigerant drink in fevers. Dose, as an aperient, 1 to 2 drachms; as a cathartic, ½ to 1 ounce.

Potassii Bromidum or Potassium Bromide. Valuable as a nerve sedative in epilepsy, convulsions, hysteria, tetanus, delirium tremens, and in general nervous excitement. Dose, 10 to 20 grains.

Potassii Carbonas or Potassium Carbonate. Used as an antacid in dyspepsia, a diuretic in dropsy, an antilithic in uric acid gravel; and as lotion, bath, or ointment in cutaneous affections. In the bath, from ½ to 1 pound may be dissolved; lotions, 2 or 3 drachms in a pint of water; and ointments, from 10 grains to 1 drachm in an ounce of lard. Dose internally, 10 to 30 grains.

Potassii Chloras or Potassium Chlorate. Used in follicular and gangrenous stomatitis, scarlatina, diphtheria, pharyngitis, chronic cystitis, and other inflammation of the mucous membrane; as an injection with laudanum in hemorrhoids it is especially effective. Dose, 5 to 15 grains.

Potassii Citras or Potassium Citrate. A refrigerant diaphoretic in fevers; dissolved in lemon juice it is effective in rheumatism and gout; also valuable in the first stage of acute bronchitis. Dose, 20 to 25 grains. The Effervescent Potassium Citrate is an agreeable form of administering potassium citrate, and may be given in doses of from 1 to 2 teaspoonfuls in cold water.

Potassii Cyanidum or Potassium Cyanide. Acts like hydrocyanic acid (prussic acid) both as a poison and as a medicine. Dose, ⅛ of a grain.

Potassii et Sodii Tartras, Potassium and Sodium Tartrate or Rochelle Salts. A mild, cooling purgative, easily borne by the sensitive and irritated stomach. It is one of the ingredients of Seidlitz Powders. Dose as a purge, from ½ to 1 ounce.

Potassii Hyroxidum or Caustic Potash. Used in the form of sticks or in solution as

a powerful escharotic. It extends its action much more deeply than does lunar caustic or silver nitrate, and is more frequently used in opening and enlarging abscesses.

Potassii Hypophosphis or Potassium Hypophosphite. Used in phthisis, loss of nerve power, debility of the brain, and scrofulous affections of children. Dose, 10 to 30 grains.

Potassii Iodidum or Potassium Iodide. Used in rheumatism, for softening inflammatory deposits, removal of exudations, and chronic pleurisies. Dose, 5 to 20 grains.

Potassii Nitras, Potassium Nitrate or Nitre. Used occasionally as a local remedy for stomatitis, angina, and for inhaling in asthma. When given internally it has proved very irritating to the gastro-intestinal canal.

Potassii Permanganas or Potassium Permanganate. Used in the treatment of fetid ulcers, abscesses, carbuncles, and wounds with fetid discharges; a stimulant application in chronic and indolent ulcers. Used internally in atonic amenorrhœa. Dose, 1 to 2 grains.

Potassii Sulphas or Potassium Sulphate. A mild purgative. In doses of from 20 grains to ½ a drachm it is aperient; in doses of from 4 to 5 drachms it is a purgative; in large doses, it is a poison. Dose, 20 grains to 4 drachms.

Prunum or Prune. The partly dried ripe fruit of the *Prunus domestica.* Laxative and nutritive, prunes form an excellent diet in costiveness. In too large quantities they cause flatulence, griping, and indigestion.

Prunus Virginiana or Wild Cherry. The bark of *Prunus serotina,* gathered in the autumn. Possesses tonic properties, calms irritation, and diminishes nervous excitability. Much used in the hectic fever of scrofula and consumption. Dose, 30 to 60 grains.

Pulveres or **Powders.** A convenient form for administering medicines of small dose, agreeable taste, of no corrosive property, and not liable to deliquesce. When composed of only one substance, the powder is simple; when of more than one, compound. It is customary to sift the powder after the substance has been pulverized in a mortar.

Pulvis Acetanilidi Compositus or Compound Acetanilid Powder. Acetanilid, 70 parts; Sodium Bicarbonate, 20 parts. The essential composition of most of the proprietary headache powders used in the treatment of migraine and neuralgia. Dose, 5 to 10 grains.

Pulvis Aromaticus or Aromatic Powder. Saigon Cinnamon, 35 parts; Ginger, 35 parts; Cardamom, 15 parts; Nutmeg, 15 parts. Stimulant and carminative in cases of weak digestion with flatulence. Also used as a spice plaster and applied over the stomach in cases of nausea and vomiting. Dose, 10 to 30 grains.

Pulvis Cretae Compositus or Compound Chalk Powder. Prepared Chalk, 30 parts; Acacia, 20 parts; Sugar, 50 parts. Used for making Mistura Cretae or Chalk Mixture. Dose, ½ to 2 drachms.

Pulvis Effervescens Compositus, Compound Effervescing Powder or Seidlitz Powder. Sodium Bicarbonate, 31 grammes; Potassium and Sodium Tartrate, 93 grammes. Mix and divide into 12 powders. Then take Tartaric Acid, 27 grammes, and divide into 12 powders. Dose, 1 set of powders.

Pulvis Glycyrrhizae Compositus, Compound Powder of Glycyrrhiza or Compound Licorice Powder. Senna, 18 parts; Glycyrrhiza, 23.6 parts; Washed Sulphur, 8 parts; Oil of Fennel, 0.4 parts; Sugar, 50 parts. An agreeable laxative. Dose, 30 grains.

Pulvis Ipecacuanhae et Opii, Powder of Ipecac and Opium or Dover's Powder. Ipecac, 10 parts; Powdered Opium, 10 parts; Sugar of Milk, 80 parts. An excellent anodyne diaphoretic, when there is not much fever, brain disturbance, or sick stomach. Used in rheumatism, pneumonia, dysentery, diarrhœa. There is 1 grain of opium in 10 grains of the powder. Dose, 5 to 15 grains repeated in 4, 6, or 8 hours. Its sweating effects may be increased by warm drinks of lemonade or herb tea.

Pulvis Jalapae Compositus or Compound Powder of Jalap. Jalap, 30 parts; Potassium Bitartrate, 65 parts. A good cathartic in dropsy and scrofulous diseases of glands or joints. Dose, 30 grains to 1 drachm.

Pulvis Morphinae Compositus, Compound Powder of Morphine or Tully's Powder. Morphine Sulphate, 1½ parts; Camphor, 32 parts; Glycyrrhiza, 33 parts; Precipitated Calcium Carbonate, 33½ parts; Alcohol, to make 100 parts. A substitute for Dover's Powder. One grain of the powder contains 1-67 of a grain of morphine sulphate. Dose, 10 grains containing about 1-6 of a grain of morphine sulphate.

Pulvis Rhei Compositus, Compound Powder of Rhubarb or Gregory's Powder. Rhubarb, 25 parts; Magnesium Oxide, 65 parts; Ginger, 10 parts. A good laxative antacid for bowel troubles of children.

Dose for an adult, ½ to 1 drachm; for a child 2 or 3 years old, 5 to 10 grains.

Pyrethrum or Pellitory. The root of *Anachyclus pyrethrum,* found on the coasts of the Mediterranean. A powerful irritant, used as a sialagogue in headache, rheumatic and neuralgic pains in the face, toothache, palsy of face, tongue, or throat; and in relaxation of the uvula. A piece of the root may be chewed, or the mouth and throat may be gargled. Dose, 20 grains.

Pyrogallol or Pyrogallic Acid. A triatomic phenol obtained by heating gallic acid. A stimulant antiseptic in lupus, psoriasis, and other skin diseases. Extremely dangerous.

Pyroxylinum, Pyroxylin or Soluble Gun Cotton. Prepared by the action of nitric and sulphuric acids on cotton. Used in the preparation of Collodion.

Quassia. The wood of *Picrasma excelsa,* Jamaica Quassia, or of *Quassia amara,* Surinam Quassia. A tonic, simple bitter, invigorating to the digestive organs; excellent in failure of appetite and in general gastric debility. Given in infusion, tincture, extract, or fluidextract. Dose of the wood, 5 to 10 grains.

Quercus or White Oak. The dried bark of *Quercus alba.* A tonic astringent used externally in marasmus, scrofula, intermittent fevers, chronic diarrhœa, and cholera infantum as a bath. An injection in leucorrhœa; a wash in piles and prolapsus ani; and a gargle in prolapsed uvula.

Quillaja or Soap Bark. The dried bark of *Quillaja saponaria,* found in Peru and Chili. Much used in the arts for washing fabrics for which soap would not be suitable.

Quinina or Quinine. An alkaloid obtained from the bark of several species of *Cinchona.* Quinine Bisulphate, Quinine Hydrobromide, Quinine Hydrochloride, and Quinine Salicylate are all official preparations given in doses of from 2 to 10 grains.

Quininae Sulphas or Quinine Sulphate. Tonic, antiperiodic, antipyretic. The most efficient drug known in malarial diseases, in which it acts by poisoning the Plasmodium malariae in the blood. It is antipyretic in febrile diseases. Dose, 1 to 10 grains. As a tonic 1 grain may be given three times a day.

Resina or Rosin. The residue left after distilling of the volatile oil of turpentine. Used in ointments and plasters.

Resinae or Resins. Solid, brittle preparations derived from substances by exhausting with alcohol and then precipitating the resin by the addition of water with which the alcohol unites.

Resina Jalapae or Resin of Jalap. Made into pills with mucilage or alcohol. Dose, 2 to 5 grains.

Resina Podophylli or Resin of Podophyllum. A powerful cathartic. Dose, ⅛ to ¼ grain.

Resina Scammonii or Resin of Scammony. Dose, 4 to 8 grains.

Resorcinol. A diatomic phenol known chemically as metadihydroxybenzene. It is similar in its effects to phenol; internally administered in gastric and intestinal catarrh, gastric ulcer, and enteritis. In a solution of from 1 to 15 per cent it is used in hay fever, nasal catarrh, chronic inflammation of the ear, and leucorrhœa. Valuable in eczema and the several parasitic skin diseases without inflammation. Dose, 2 to 5 grains.

Rhamnus Purshiana or Cascara Sagrada. The dried bark of *Rhamnus purshiana,* found in California. An excellent laxative in habitual constipation; best administered as tincture or fluidextract.

Rheum or Rhubarb. The dried rhizome of *Rheum palmatum,* found around the Caspian Sea and the Volga. The several varieties in commerce are known as: Chinese Rhubarb and European Rhubarb, embracing English and French. While it is cathartic it is also astringent—a peculiar and apparently paradoxical combination of opposing qualities. Used in dyspepsia with constipation, diarrhœa when purging is needed, secondary stages of cholera infantum, chronic dysentery, and in all cases of enfeebled condition when mild purging is called for. Dose as a purgative, 20 to 30 grains; as a stomachic and laxative, 5 to 10 grains.

Rhus Glabra or Sumach. The dried fruit of *Rhus glabra,* found in Canada and throughout the United States. Astringent and refrigerant, used as a gargle in angina.

Rosa Gallica or Red Rose. The dried petals of *Rosa gallica* collected in the bud. Slightly astringent and tonic. Used as an agreeable vehicle for tonic and astringent medicines.

Rubus or Blackberry. The dried bark of the rhizome of *Rubus villosus,* and other species. Favorite domestic remedy for diarrhœas. The decoction is made by boiling one ounce of small roots, or of the bark of the large roots, in a pint and a half of water down to one pint. Of this decoction from

1 to 2 fluidounces may be given to an adult 3 or 4 times a day or oftener.

Sabina or Savine. The tops of *Juniperus sabina,* found in the south of Europe, the Levant, and found wild near the great lakes of the United States. It is highly irritant, and used in amenorrhœa and atonic menorrhagia. Dose, 5 to 10 grains.

Saccharum or Cane Sugar. The refined sugar obtained from *Saccharum officinarum* and from several species of *Sorghum.* Apart from its food value, sugar is of use in the manufacture of several mixtures, pills, powders, confections, syrups, and all troches.

Saccharum Lactis or Sugar of Milk.

Safrolum or Safrol. The synthetic oil of sassafras. In all its physiological and therapeutical effects safrol is the same as oil of sassafras. Dose, 5 to 10 minims.

Salicinum or Salicin. Obtained from several species of *Salix* (Willow) and *Populus* (Poplar). For some time salicin was employed in rheumatism, but has been largely supplanted by salicylic acid. Dose, 10 to 30 grains.

Salvia or Sage. The dried leaves of *Salvia officinalis.* Tonic, astringent, and aromatic. Dose, 20 to 60 grains.

Sanguinaria or Bloodroot. The dried rhizome of *Sanguinaria canadensis.* An emetic and stimulant narcotic; used as a stimulant expectorant in advanced stages of bronchitis. Dose, 2 grains according to the U. S. P.

Santalum Rubrum or Red Saunders. The heart-wood of *Pterocarpus santalinus,* found in India and Ceylon. Used as a coloring agent.

Santonica or Levant Wormseed. The dried unexpanded flower heads of *Artemisia pauciflora,* found in Europe and northern Asia. Its active principle is santonin.

Santonin. Obtained from santonica. It is a stimulant to the optic nerve in amaurosis; but is best known as a vermicide. Mixed with sugar and tragacanth, santonin is made into lozenges that are palatable and effective as a vermifuge. Dose for an adult, 2 to 4 grains; for a child 2 or 3 years old, ¼ to ½ a grain.

Sapo or White Castile Soap. Made from sodium hydroxide and olive oil. Used with water to form an enema in cases of constipation resulting from impacted or hardened fæces. This enema is generally made by dissolving two tablespoonfuls of soft soap in a pint of warm water. Soap is used in pharmacy as an excipient in making pills, and as an ingredient of liniments and plasters. Dose, 5 grains to ½ drachm.

Sapo Mollis or Soft Soap. Soap made from potassium hydroxide and olive oil or from linseed oil, potassium hydroxide, alcohol, and water. Green soap or German soap has long been made in Europe from linseed or other vegetable oil, potassium hydroxide, and a little sodium hydrate. The green color is probably due to some chlorophyll or green coloring vegetable matter in the oils. It is the *savon vert* of France. This green soap differs in no way from the soft soap here mentioned. It is used as an application in skin diseases, but especially in *eczema rubrum.* It owes its efficacy probably to the excess of potassium hydroxide (caustic potash).

Sarsaparilla. The dried root of *Smilax medica,* grown in Asia, South America, and Central America. Used in syphilis, scrofulous diseases, and cutaneous affections, and generally classed as an alterative. Dose, 30 to 60 grains.

Sassafras. The dried bark of the root of *Sassafras variifolium.*

Sassafras Medullae or Sassafras Pith. The dried pith of *Sassafras variifolium,* common in the United States and Mexico. From its abundant gummy matter is made a mucilage of great service in inflammation of the eyes; and a demulcent drink in dysentery, catarrh, and nephritis. It is made by adding a drachm of the pith to a pint of boiling water. Dose of the bark, 1 to 2 drachms.

Scammonium or Scammony. A gum-resin exuding from the root of *Convolvulus scammonia,* exported from Smyrna. An active cathartic, often causing discomfort. Dose, 5 to 10 grains.

Scilla or Squill. The bulb of *Urginea maritima,* grown on the coasts of the Mediterranean. Expectorant, diuretic, emetic, and purgative; used in dropsy and croup. Dose 1 to 2 grains; in large doses, emetic.

Scoparius or Broom. The dried tops of *Cytisus scoparius,* grown in Europe. Diuretic, cathartic, and emetic; used in dropsy. Dose, 10 to 15 grains.

Scopola. The dried rhizome of *Scopola carniolica,* found in Central Europe. Very similar in its medicinal properties to belladonna. Used in the manufacture of belladonna plasters and as a source of hyoscyamine. Dose, 1 to 2 grains.

Scutellaria or Skullcap. The entire plant of *Scutellaria lateriflora,* common throughout Canada and the United States.

Has enjoyed a high reputation as a remedy in hydrophobia, neuralgia, and cases of nervous excitement. Dose, 30 to 90 grains.

Senega or Senega Snakeroot. The dried root of *Polygala senega,* common in Canada and the United States. A stimulant expectorant used in bronchitis, asthma, and other inflammatory pulmonic affections. Dose, 15 to 20 grains.

Senna. The dried leaflets of *Cassia acutifolia* or *Cassia angustifolia,* found in India and Egypt. The varieties of commerce are Alexandria Senna, Tripoli Senna, India Senna, and Mecca Senna. A prompt, efficient, and safe purgative; of service in fevers. Its griping effects are overcome by the use of an aromatic or an alkaline salt such as Epsom Salt. Dose, ½ to 2 drachms.

Serpentaria or Virginia Snakeroot. The dried rhizome and roots of *Aristolochia serpentaria,* found everywhere. A feeble stimulant tonic of use in intermittent fevers and in dyspepsia. Dose, 15 to 30 grains.

Serum Antidiphtheriçum or Diphtheria Antitoxin. A fluid separated from the coagulated blood of a horse rendered immune by inoculation of diphtheric toxin. Discovered independently by Behring and Roux in 1894. Diphtheria antitoxin is made by injecting diphtheria poison into horses, usually by subcutaneous (under the skin) injection. The horse is chosen because it supplies a large quantity of blood and because this animal is very sensitive to diphtheria poison. The first injection of diphtheria poison is small—only 1-10 of a cubic centimeter. Swelling occurs at the point of inoculation attended by fever and loss of appetite. In a few days these symptoms disappear. A larger dose is then injected, until at the end of a few months the horse can stand a dose of from 500 to 1,000 cubic centimeters of the poison with less discomfort than attended the extremely small first dose. All the while the amount of antitoxin has been steadily accumulating in the horse's blood. The horse is bled from the external jugular vein. The blood, collected in long flasks or tubes, is allowed to clot. The clear serum collects and is drawn off by means of a pipette. This clear serum is the Diphtheria Antitoxin. It is a true specific for diphtheria, provided that it is given in a sufficiently large quantity and early enough. As soon as the disease is suspected the antitoxin should be administered, for statistics prove that every hour of delay lessens the chance of successfully coping with the disease. The curative dose is from 2,000 to 5,000 units, repeated every 4 or 8 hours until favorable results are perceptible. The antitoxin is administered by a hypodermic syringe under the skin in any part of the body where the skin is loose. Near the angle of the shoulder blade is a favored spot; though the flank or abdomen are often chosen. When administered by the mouth the effects are slow, uncertain, and unsatisfactory. Its effects are harmless, and not only the suspected patient but also those exposed to the infection should be treated.

Sevum Preparatum or Prepared Suet. The internal fat of the abdomen of the sheep, melted and strained. It is used in the preparation of cerates and ointments.

Sinapis Alba or White Mustard. The dried ripe seeds of *Sinapis alba.*

Sinapis Nigra or Black Mustard. The seed of *Brassica nigra.* Mustard seeds are swallowed whole as a laxative, and as a cure for dyspepsia in doses of one tablespoonful once or twice a day. The seeds may be moistened with molasses or immersed in hot water. Mustard powder is an efficient emetic in quantities of 1 or 2 teaspoonfuls. The greatest value of mustard lies in its power as a rubefacient, best applied in the form of a cataplasm. Dose, 1 or 2 drachms.

Sodii Acetas or Sodium Acetate. Diuretic but rarely used. Its chief value is as a source of acetic acid by the action of sulphuric acid. Dose, 20 grains to 2 drachms.

Sodii Arsenas or Sodium Arsenate. Used as other compounds of arsenic in chorea and other nervous diseases and in rheumatic gout. Dose, 1-10 of a grain.

Sodii Benzoas or Sodium Benzoate. A remedy for gout, rheumatism, lithæmia, and tuberculosis. Dose, 20 to 30 grains.

Sodii Bicarbonas or Sodium Bicarbonate. Common baking soda or saleratus. Of mild taste and slight irritating properties; the bicarbonate is often used instead of the carbonate in calculi with excess of uric acid, infantile croup, and pneumonia. Dose for an adult, 10 grains to 1 drachm.

Sodii Bisulphis or Sodium Bisulphite. Used as all sulphites (see Sodii Sulphis). Dose, 5 to 15 grains.

Sodii Boras, Sodium Borate or Borax. Uses and effects are the same as those of boric acid. Used in gout, epilepsy; as a powder or solution in external treatment of wounds, ulcers, and abscesses. Of great value in inflammations of the mouth, of mucous membranes generally, and in conjunctivitis. Dose, 10 to 20 grains.

Sodii Bromidum or Sodium Bromide. Similar to the effects of potassium bromide,

except that sodium bromide is not so high a depressant of the circulation. Dose, 15 grains to 1 drachm.

Sodii Chloras or Sodium Chlorate. Effects the same as those of potassium chlorate, but it is much more soluble. Dose, 5 to 15 grains.

Sodii Chloridum, Sodium Chloride or Common Salt. In small doses, a stomachic tonic and anthelmintic; in larger doses, a purgative and emetic. In hæmoptysis a teaspoonful of common salt, taken dry, will sometimes check the flow of blood. It is a valuable external fomentation in sprains, bruises, and as a bath for depraved conditions often existing in a child. Dose as a cathartic, 2 drachms to half an ounce; as an emetic, ½ ounce to 1 ounce; as a clyster, 2 tablespoonfuls to be dissolved in a pail of water.

Sodii Citras or Sodium Citrate. Used for the same purposes as potassium citrate. Dose, 15 to 60 grains.

Sodii Hydroxidum or Caustic Soda. Used in gall-stones, acidity of the stomach or intestines, and externally in skin diseases.

Sodii Hypophosphis or Sodium Hypophosphite. Used in phthisis, loss of nerve power, scrofula, and defects of bone tissues. Dose, 10 to 20 grains.

Sodii Iodidum or Sodium Iodide. Of the same value as potassium iodide. Dose, 10 grains.

Sodii Nitras or Sodium Nitrate. An important remedy in dysentery, but rarely used. Dose, ½ to 1 ounce.

Sodii Nitris or Sodium Nitrite. Effects are similar to those of amyl nitrite or nitroglycerine. Commencing dose, never to exceed 3 grains.

Sodii Phosphas or Sodium Phosphate. A mild purgative acting very favorably with small children and with adults of delicate stomach. Restores healthy color of stool in cases of children suffering from deficient or disordered bile as indicated by white or green stools with diarrhœa. Dose, 3 to 10 grains. Small doses according to age may be given to children in milk.

Sodii Salicylas or Sodium Salicylate. Effects are the same as those of salicylic acid, except that sodium salicylate is more soluble and less irritating. Dose, 10 to 30 grains.

Sodii Sulphas, Sodium Sulphate or Glauber's Salts. An effective hydragogue cathartic; in small doses, a diuretic and aperient. Dose, 2 drachms to 1 ounce.

Sodii Sulphis or Sodium Sulphite. Used in yeasty vomiting; as an outward application to aphthous sore mouth. Dose, 15 to 60 grains; as a wash, a drachm of the salt in an ounce of water.

Sodii Thiosulphas or Sodium Thiosulphate. A powerful poison to fungi in pyæmia, zymotic disorders, parasitic affections of the mouth and skin. Dose, 10 to 20 grains; as a wash, a drachm dissolved in an ounce of water.

Sparteinae Sulphas or Sparteine Sulphate. An alkaloid possessing the same effects as those of scoparius, from which it is derived. Dose, 1-6 to ½ grain.

Spigelia or Pinkroot. The dried rhizome and roots of *Spigelia marilandica* or Carolina pink. A powerful anthelmintic. A worm tea consists of spigelia, senna, manna, and savine. Dose of the powdered root, for a child 3 or 4 years old, 10 to 20 grains; for an adult, 1 to 2 drachms. Give the proper dose night and morning for several successive days and follow with a brisk cathartic.

Spiritus or **Spirits.** Alcoholic solutions of volatile substances formerly obtained by distillation, but now usually made by dissolving the volatile substance in alcohol.

Spiritus Aetheris or Spirit of Ether. Ether, 32½ parts; Alcohol, 67½ parts. Dose, 1 to 3 fluidrachms.

Spiritus Aetheris Compositus, Compound Spirit of Ether or Hoffman's Anodyne. Ether, 32½ parts; Alcohol, 65 parts; Ethereal Oil, 2½ parts. Very useful in nervous irritation and consequent loss of sleep. Dose, 30 minims to 2 fluidrachms.

Spiritus Aetheris Nitrosi or Sweet Spirit of Nitre. An alcoholic solution of Ethyl Nitrite—not less than 4 per cent. Diaphoretic, diuretic, and antispasmodic. A very popular and useful remedy. Dose, ½ to 1 fluidrachm.

Spiritus Ammoniae Aromaticus. See Aromatic Spirit of Ammonia.

Spiritus Amygdalae Amarae or Spirit of Bitter Almond. A 1 per cent solution of the oil in alcohol and water. Used as a flavoring extract in quantities of only a few drops, as it contains hydrocyanic acid. Dose, 2 to 8 minims.

Spiritus Anise or Spirit of Anise. A 10 per cent solution of the Oil of Anise in alcohol and water. A stomachic and carminative. Dose, 1 to 2 fluidrachms.

Spiritus Aurantii Compositus or Compound Spirit of Orange. A 20 per cent

solution of the Oil of Orange Peel in alcohol and water. A useful and fragrant addition to prescriptions.

Spiritus Camphorae or Spirit of Camphor. Camphor, 10 grammes; Alcohol, to make 100 cubic centimeters. Used locally in liniments, and internally in affections of the alimentary canal and as an antispasmodic. Dose, 10 to 30 minims.

Spiritus Chloroformi or Spirit of Chloroform. Chloroform, 6 parts; Alcohol, 94 parts. An internal remedy in gastric spasm. Dose, 10 to 60 minims.

Spiritus Cinnamomi or Spirit of Cinnamon. A 10 per cent solution of the Oil of Cinnamon in alcohol. An agreeable aromatic cordial. Dose, 5 to 20 minims in water.

Spiritus Frumenti or Whiskey. An alcoholic stimulant; its tendency to cause constipation is less than that of brandy.

Spiritus Gaultheria or Spirit of Wintergreen. A 5 per cent solution of Oil of Gaultheria in alcohol. A flavoring agent. Dose, 10 to 20 minims.

Spiritus Glycerylis Nitratis, Spirit of Nitroglycerine or Spirit of Glonoin. A 1 per cent solution of Glyceryl Trinitrate in alcohol. Its effect upon the system is the same as that of the nitrites. Used in angina pectoris, asthma, convulsions; a cardiac stimulant in poisoning by illuminating gas or in collapse. Dose, 1 to 2 minims.

Spiritus Juniperi Compositus, Compound Spirit of Juniper. Corresponds very closely to Holland Gin. Contains Oil of Juniper, Oil of Caraway, Oil of Fennel, alcohol, and water. Added to diuretic mixtures in dropsy. Dose, 2 to 4 fluidrachms.

Spiritus Lavandulae or Spirit of Lavender. A 5 per cent solution of Oil of Lavender Flowers in alcohol. A perfume and ingredient of other preparations. Dose, 5 to 10 minims.

Spiritus Menthae Piperitae or Spirit of Peppermint. Popularly known as Essence of Peppermint. A 10 per cent solution of the Oil of Peppermint in alcohol. Dose, 10 to 30 minims.

Spiritus Menthae Viridis or Spirit of Spearmint. A 10 per cent solution of Oil of Spearmint in alcohol. Like peppermint it is a carminative. Dose, 10 to 30 minims.

Spiritus Vini Gallici or Brandy. A cordial and stomachic; often given in the sinking stages of low fevers.

Staphisagria or Stavesacre. The ripe seed of *Delphinium staphisagria* of southern Europe. An emetic and cathartic, seldom used internally because of its violence. A tincture has been used as a liniment in rheumatism; an ointment destroys lice and the itch insect.

Stillingia or Queen's Root. The dried root of *Stillingia sylvatica,* found from Virginia to Florida. In large doses an emetic and cathartic; in smaller doses, an alterative in syphilis, scrofula, cutaneous diseases, and chronic liver troubles. Best administered as fluidextract.

Stramonium. The dried leaves of *Datura stramonium.* Very similar in its effects to belladonna. Used in asthma, the dried leaves being smoked as tobacco. Dose, 1 to 5 grains of the leaves.

Strontii Bromidum or Strontium Bromide. Used in epilepsy in place of potassium bromide, as it deranges nutrition less and is less irritating. Dose, 15 to 30 grains.

Strontii Iodidum or Strontium Iodide. Supplies the alterative influence of iodine without the irritating effect. Dose, 5 to 15 grains.

Strontii Salicylas or Strontium Salicylate. Of especial value in rheumatism, as it has slight disturbing effect upon digestion. Dose, 5 to 30 grains.

Strophanthus. The ripe seed of *Strophanthus kombé,* found in Africa and Asia. It is known as arrow-poison in Africa. Its use in medicine is much the same as that of digitalis; but it requires extreme caution on account of its highly poisonous properties. Dose, ½ to 2 grains.

Strychnina or Strychnine. An alkaloid derived from Nux Vomica. While highly poisonous, it is a very valuable tonic, usually given with iron and quinine or other simple bitter in anæmia; also in palsies, bronchitis, anæsthesia, shock, narcotic poisoning, and a stimulant in low diseases. Dose, 1-30 to 1-60 of a grain. Strychnine Nitrate and Strychnine Sulphate are also official.

Styrax. A balsam obtained from the *Liquidambar orientalis,* found in Asia Minor. A stimulant expectorant and feeble germicide; important now as an ingredient of the Compound Tincture of Benzoin. Dose, 10 to 20 grains.

Sulphonethylmethanum or Sulphonethylmethane. Called also trional; produces quiet, apparently normal, sleep in from 15 minutes to 1 hour after taking, without unpleasant after-effects. Dose, 10 to 20 grains.

Sulphomethanum or Sulphomethane. Also called sulphonal; produces sleep in from half an hour to an hour after taking without unpleasant after-effects. Dose, 10 to 40 grains in powder.

Sulphur Lotum or Washed Sulphur. Dose, 1 to 3 drachms.

Sulphur Precipitatum, Precipitated Sulphur or Milk of Sulphur. Similar in properties to Sublimed Sulphur. Dose, 1 to 3 drachms.

Sulphur Sublimatum or Sublimed Sulphur. Laxative, diaphoretic and resolvent. Used in hemorrhoids, gout, rheumatism, catarrh, and asthma. Locally it is used in scabies or itch; blown into the throat in diphtheria. Dose, 1 to 3 drachms.

Sulphuris Iodidum or Sulphur Iodide. Prepared by the direct action of sulphur and iodine. Used in the form of ointment in skin diseases such as tinea capitis, lupus, and lepra.

Sumbul or Muskroot. The dried rhizome and root of a plant, probably of the *Umbelliferae* family, found in Asia. A nervous stimulant, antispasmodic, used in dysentery, diarrhœa, amenorrhœa, hysteria, chlorosis. Dose, ½ to 2 drachms.

Suppositoria or **Suppositories.** Solid bodies intended to convey medicinal agents into the body, usually by way of the rectum, with a view to either evacuating the bowel or to apply curative agents to the mucous membrane. Cacao butter has been used since 1852 and has proved very serviceable, as it melts at about the temperature of the body after it has been inserted. Sometimes in warm weather or in hot countries, wax, resin, or some less easily melting substance is mixed with the cacao butter.

Suppositoria Glycerini or Suppositories of Glycerine. Glycerine, 30 grammes; Monohydrated Sodium Carbonate, ½ gramme; Stearic Acid, 2 grammes; Water, 5 cubic centimeters. To make 10 suppositories. Much used in constipation. The long continued use of these or of any suppositories may be harmful.

Syrupi or **Syrups.** Concentrated solutions of sugar in aqueous fluids, with or without medicinal agents. Without medicines, they are called simple syrups; with medicines, medicated syrups.

Syrupus, Syrup, or Simple Syrup. Sugar, 850 grammes; Water, to make 100 cubic centimeters. Used in making pills, mixtures, and many other pharmaceutical preparations.

Syrupus Acaciae or Syrup of Acacia. Acacia, 100 grammes; Sugar, 800 grammes; Water, 430 cubic centimeters. Used in the preparation of mixtures, pills, troches, and as a demulcent to add to prescriptions.

Syrupus Acidi Citrici or Syrup of Citric Acid. Citric Acid, 10 grammes; Water, 10 cubic centimeters; Tincture of Fresh Lemon Peel, 10 cubic centimeters; Syrup, to make 1,000 cubic centimeters. An agreeable and refrigerant addition to carbonated drinks.

Syrupus Acidi Hydriodici or Syrup of Hydriodic Acid. Diluted Hydriodic Acid, 100 grammes; Water, 300 grammes; Syrup, 600 grammes. Used to produce alterative effects in scrofula. Dose, 1 to 2 fluidrachms.

Syrupus Amygdalae or Syrup of Almond. Spirit of Bitter Almond, 10 cubic centimeters; Orange Flower Water, 100 cubic centimeters; Syrup, to make 1,000 cubic centimeters. Added to cough mixtures, or to conceal the taste of disagreeable medicines. Dose, 1 to 2 fluidrachms.

Syrupus Aurantii or Syrup of Orange. Tincture of Sweet Orange Peel, 50 cubic centimeters; Citric Acid, 5 grammes; Magnesium Carbonate, 10 grammes; Sugar, 820 grammes; Water, to make 1,000 cubic centimeters. Used for its agreeable flavor.

Syrupus Aurantii Florum or Syrup of Orange Flowers. Sugar, 850 grammes; Orange Flower Water, to make 1,000 cubic centimeters. A flavoring agent. Dose, 1 fluidrachm.

Syrupus Calcii Lactophosphatis or Syrup of Calcium Lactophosphate. Precipitated Calcium Carbonate, 25 grammes; Lactic Acid, 60 cubic centimeters; Phosphoric Acid, 36 cubic centimeters; Orange Flower Water, 50 cubic centimeters; Sugar, 725 grammes; Water, to make 1,000 cubic centimeters. An excellent mode of administering Calcium Phosphate. Dose, 2 to 4 fluidrachms.

Syrupus Calcis, Syrup of Lime or Syrup of Calcium Hydroxide. Lime, 65 grammes; Sugar, 350 grammes; Water, to make 1,000 cubic centimeters. An active antacid and astringent, much used in place of limewater. Dose, 10 to 30 minims.

Syrupus Ferri Iodidi or Syrup of Ferrous Iodide. Iron Wine, 12½ grammes; Iodine, 41½ grammes; Diluted Hypophosphorous Acid, 20 cubic centimeters; Sugar, 600 grammes; Water, to make 1,000 cubic centimeters. A combination of the alterative effect of iodine with the action of iron; very useful in tuberculosis and scrofula of

children. Dose for an adult, 30 to 40 minims; for a child of two years, 5 to 10 minims.

Syrupus Hypophosphitum or Syrup of Hypophosphites. Calcium Hypophosphite, 45 grammes; Potassium Hypophosphite, 15 grammes; Sodium Hypophosphite, 15 grammes; Diluted Hypophosphorous Acid, 2 grammes; Sugar, 650 grammes; Tincture of Fresh Lemon Peel, 5 cubic centimeters; Water, to make 1,000 cubic centimeters. An excellent means of administering the hypophosphites. Dose, 1 to 2 fluidrachms.

Syrupus Hypophosphitum Compositus or Compound Syrup of Hypophosphites. Calcium Hypophosphite, 35 grammes; Potassium Hypophosphite, 17½ grammes; Sodium Hypophosphite, 17½ grammes; Ferric Hypophosphite, 2¼ grammes; Manganese Hypophosphite, 2¼ grammes; Quinine, 1.1 grammes; Strychnine, 115 milligrammes; Sodium Citrate, 3¾ grammes; Diluted Hypophosphorous Acid, 15 cubic centimeters; Sugar, 775 grammes; Water, to make 1,000 cubic centimeters. An excellent combination of the properties of the hypophosphites and the effects of iron; in scrofula. Dose, 1 to 2 fluidrachms.

Syrupus Krameriae or Syrup of Krameria. Fluidextract of Krameria, 450 cubic centimeters; Syrup, 550 cubic centimeters. Dose, 2 fluidrachms; for a child a year or two old, 10 to 20 minims.

Syrupus Lactucarii or Syrup of Lactucarium. Dose, 2 to 3 fluidrachms.

Syrupus Picis Liquidae or Syrup of Tar. Tar, 5 grammes; Alcohol, 50 cubic centimeters; Magnesium Carbonate, 10 grammes; Sugar, 850 grammes; Water, to make 1,000 cubic centimeters. Dose, 1 to 2 fluidrachms.

Syrupus Pruni Virginianae or Syrup of Wild Cherry. Wild Cherry Bark in powder, 150 grammes; Sugar, 700 grammes; Glycerine, 150 cubic centimeters; Water, to make 1,000 cubic centimeters. Largely used as a basis for cough mixtures. Dose, ½ fluidounce.

Syrupus Rhei or Syrup of Rhubarb. Fluidextract of Rhubarb, 100 cubic centimeters; Spirit of Cinnamon, 4 cubic centimeters; Potassium Carbonate, 10 grammes; Water, 50 cubic centimeters; Syrup, to make 1,000 cubic centimeters. Dose, 1 to 2 fluidrachms.

Syrupus Rhei Aromaticus or Aromatic Syrup of Rhubarb. Aromatic Tincture of Rhubarb, 150 cubic centimeters; Potassium Carbonate, 1 gramme; Syrup, 850 cubic centimeters. A warm stomachic laxative, too feeble for adults but well suited for the bowel complaints of children in summer. Dose for an infant with diarrhœa, 1 fluidrachm.

Syrupus Rosae or Syrup of Rose. Fluidextract of Rose, 125 cubic centimeters; Diluted Sulphuric Acid, 10 cubic centimeters; Sugar, 750 grammes; Water, to make 1,000 cubic centimeters. A mild astringent; but chiefly used for its fine red color. Dose, 1 fluidrachm.

Syrupus Rubi or Syrup of Blackberry Bark. Fluidextract of Rubus, 250 cubic centimeters; Syrup, 750 cubic centimeters. Used in acute diarrhœa and in chronic diarrhœa. Dose, 1 to 2 fluidrachms.

Syrupus Sarsaparillae Compositus or Compound Syrup of Sarsaparilla. Fluidextract of Sarsaparilla, 250 cubic centimeters; Fluidextract of Glycyrrhiza, 15 cubic centimeters; Fluidextract of Senna, 15 cubic centimeters; Sugar, 650 grammes; Oil of Sassafras, 2-10 of a cubic centimeter; Oil of Anise, 2-10 of a cubic centimeter; Oil of Gaultheria, 2-10 of a cubic centimeter; Water, to make 1,000 cubic centimeters. Dose, ½ fluidounce.

Syrupus Scillae or Syrup of Squill. Vinegar of Squill, 450 cubic centimeters; Sugar, 800 grammes; Water, to make 1,000 cubic centimeters. An expectorant, useful in infantile bronchitis. Dose, 1 fluidrachm.

Syrupus Scillae Compositus or Compound Syrup of Squill. Fluidextract of Squill, 80 cubic centimeters; Fluidextract of Senega, 80 cubic centimeters; Antimony and Potassium Tartrate, 2 grammes; Purified Talc, 20 grammes; Sugar, 750 grammes; Water, to make 1,000 cubic centimeters. Emetic, diaphoretic, expectorant, and cathartic. Given in mild cases of croup. Dose, for a child, from 10 minims to a fluidrachm, according to age; for adults, as an expectorant, 20 to 30 minims.

Syrupus Senegae or Syrup of Senega. Fluidextract of Senega, 200 cubic centimeters; Syrup, 800 cubic centimeters. Used in pectoral complaints. Dose, 1 to 2 fluidrachms.

Syrupus Sennae or Syrup of Senna. Fluidextract of Senna, 250 cubic centimeters; Oil of Coriander, 5 cubic centimeters; Syrup, to make 1,000 cubic centimeters. Dose for an adult, 2 to 4 fluidrachms; for children, not more than from ⅛ to ½ that quantity.

Syrupus Tolutanus or Syrup of Tolu. Tincture of Tolu, 50 cubic centimeters; Magnesium Carbonate, 10 grammes; Sugar,

820 grammes; Water, to make 1,000 cubic centimeters. Used chiefly for its agreeable flavor.

Syrupus Zingiberis or Syrup of Ginger. Fluidextract of Ginger, 30 cubic centimeters; Alcohol, 20 cubic centimeters; Magnesium Carbonate, 10 grammes; Sugar, 820 grammes; Water, to make 1,000 cubic centimeters. A warm stomachic addition to tonics and purgatives, and a flavoring agent. Dose, 1 fluidrachm.

Talcum or Talc. A hydrous magnesium silicate.

Talcum Purificatum or Purified Talc. Used as a soothing, protecting powder, and forms the basis of most of the proprietary toilet powders.

Tamarindus or Tamarind. The pulp of the fruit of *Tamarindus indica,* found in the East Indies, Arabia, Egypt, and the West Indies. A laxative and refrigerant; when infused in water it forms an agreeable drink in fevers. Dose, 1 drachm to 1 ounce.

Taraxacum or Dandelion. The dried root of *Taraxacum officinale.* Slightly tonic, diuretic, and aperient; has a specific action on the liver. Dose, 1 to 3 drachms.

Terebenum or Terebene. Obtained by the action of concentrated sulphuric acid on oil of turpentine. A stimulant expectorant in chronic bronchitis, winter cough, acute bronchitis. Dose, 3 to 10 minims.

Terebinthina Canadensis, Canadian Turpentine, Canadian Balsam or Balsam of Fir. An oleoresin from *Abies balsamea.* The properties of the several sorts of turpentine are those of the oil of turpentine. Dose, 20 to 30 grains.

Terpini Hydras or Terpin Hydrate. Acts upon the nervous system like oil of turpentine; used in bronchitis, both chronic and acute, and in chronic cystitis. Dose, 2 to 3 grains.

Thymol. A phenol derived from the oil of *Thymus vulgaris;* used as a substitute for phenol on account of its pleasant odor. In the strength of 1 in 1,000 it is used as a dressing for unhealthy wounds; an intestinal antiseptic in catarrh of the intestines. Dose, 2 to 10 grains.

Thymolis Iodidum or Thymol Iodide. An application to ulcerations, eczema, psoriasis, and other skin affections; and a substitute for iodoform.

Tincturae or **Tinctures.** Alcoholic solutions of medicinal agents, prepared by maceration, digestion, or percolation. Ammoniated tinctures are solutions in ammonia; ethereal tinctures are solutions in ethereal spirit.

Tinctura Aconiti or Tincture of Aconite. Dose, 3 to 10 minims; but, if to be frequently repeated, 2 to 5 minims.

Tinctura Aloes or Tincture of Aloes. Dose as a purgative, 2 to 4 fluidrachms; as a laxative, ½ to 1 fluidrachm.

Tinctura Aloes et Myrrhae or Tincture of Aloes and Myrrh. Purgative, tonic, and emmenagogue; much used in chlorosis and amenorrhœa with constipation. Dose, 1 to 2 fluidrachms.

Tinctura Arnicae or Tincture of Arnica. A popular application to bruises, sprains, tumors, and in local rheumatic pains.

Tinctura Asafoetidae or Tincture of Asafoetida. Dose, 3 minims to 1 fluidrachm.

Tinctura Aurantii Amari or Tincture of Bitter Orange Peel. An agreeable addition to infusions, decoctions, and mixtures. Dose, 1 to 2 fluidrachms.

Tinctura Aurantii Dulcis or Tincture of Sweet Orange Peel. A flavoring agent.

Tinctura Belladonnae Foliorum or Tincture of Belladonna Leaves. Dose, 10 to 30 minims. The dose of the British tincture is 5 to 15 minims.

Tinctura Benzoini or Tincture of Benzoin. Is added to ointments to prevent rancidity. Dose, 20 to 30 minims.

Tinctura Benzoini Composita, Compound Tincture of Benzoin or Friar's Balsam. Contains now only 10 per cent of Benzoin instead of 12 as formerly. A stimulating expectorant in chronic catarrhs; chiefly as a local application to indolent ulcers, chapped nipples. Dose, 15 minims to 1 drachm.

Tinctura Calendulae or Tincture of Calendula. Used externally like Tincture of Arnica.

Tinctura Calumbae or Tincture of Calumba. Dose, 1 fluidrachm.

Tinctura Cannabis Indicae or Tincture of Indian Cannabis. Dose, 15 to 30 minims.

Tinctura Cantharidis or Tincture of Cantharides. Dose, 2 to 5 minims.

Tinctura Capsici or Tincture of Capsicum. Dose, 5 to 10 minims.

Tinctura Cardamomi or Tincture of Cardamom. Strength of this tincture is double that of the former preparation. Dose, ½ to 1 fluidrachm.

Tinctura Cardamomi Composita or Compound Tincture of Cardamom. Stronger than the compound tincture as formerly prepared. An aromatic tincture, carminative, and imparts an agreeable taste to other preparations. Dose, 1 to 2 fluidrachms.

Tinctura Cimicifugae or Tincture of Cimicifuga. Dose, 1 to 2 fluidrachms.

Tinctura Cinchonae or Tincture of Cinchona. Rarely prescribed, but may be used as a tonic. Dose, 1 to 2 fluidrachms.

Tinctura Cinchonae Composita or Compound Tincture of Cinchona. An excellent stomachic cordial tonic. Dose, 1 to 2 fluidrachms.

Tinctura Cinnamomi or Tincture of Cinnamon. Now double the strength of the former tincture. Dose, 1 to 4 fluidrachms.

Tinctura Colchici Seminis or Tincture of Colchicum Seed. Strength lowered to 10 per cent in the last revision of the Pharmacopœia to comply with the rule regarding potent tinctures. Dose, 15 to 30 minims.

Tinctura Digitalis or Tincture of Digitalis. One third weaker than the former tincture. Dose, 10 to 30 minims.

Tinctura Ferri Chloridi or Tincture of Ferric Chloride. One of the most active and certain of the iron preparations. A standard remedy in erysipelas. To be taken through a glass rod to protect the teeth. Dose, 5 to 30 minims.

Tinctura Gallae or Tincture of Nutgall. Powerfully astringent. Dose, 1 to 3 fluidrachms.

Tinctura Gambir Composita or Compound Tincture of Gambir. An agreeable astringent tonic designed to replace the old Compound Tincture of Catechu, than which it is much more advantageous. Dose, 2 to 4 fluidrachms; of the British tincture, ½ to 2 fluidrachms.

Tinctura Gelsemii or Tincture of Gelsemium. Dose, 10 to 30 minims.

Tinctura Gentianae Composita or Compound Tincture of Gentian. An excellent bitter much used in dyspepsia. Dose, 1 to 2 fluidrachms.

Tinctura Guaiaci or Tincture of Guaiac. Given in chronic rheumatism and gout. Dose, 1 fluidrachm.

Tinctura Guaiaci Ammoniata or Ammoniated Tincture of Guaiac. Given in chronic rheumatism and amenorrhœa. Dose, 1 to 2 fluidrachms.

Tinctura Hydrastis or Tincture of Hydrastis. Dose, 1 to 2 fluidrachms.

Tinctura Hyoscyami or Tincture of Hyoscyamus. Dose, ½ to 1 fluidrachm.

Tinctura Iodi or Tincture of Iodine. For external use in erysipelas, chilblains, and other cutaneous inflammations. Usually painted on with a camel's-hair brush.

Tinctura Ipecacuanhae et Opii or Tincture of Ipecac and Opium. Also called Fluid Dover's Powder. Dose, 5 to 10 minims.

Tinctura Kino or Tincture of Kino. Chiefly used as an addition to chalk mixture in diarrhœa. Dose, 1 to 2 fluidrachms.

Tinctura Krameriae or Tincture of Krameria. Dose, 1 to 2 fluidrachms.

Tinctura Lactucarii or Tincture of Lactucarium. Dose, ½ to 1 fluidrachm.

Tinctura Lavandulae Composita or Compound Tincture of Lavender. An excellent preparation for gastric uneasiness, nausea, and flatulence. Dose, 30 minims to 1 fluidrachm.

Tinctura Limonis Corticis or Tincture of Lemon Peel. A grateful aromatic addition to tonic infusions. Dose, 1 to 2 fluidrachms.

Tinctura Lobeliae or Tincture of Lobelia. Emetic and narcotic; much used in asthma. Dose, as an expectorant, 15 minims to 1 fluidrachm; as an emetic, 1 to 2 fluidrachms.

Tinctura Moschi or Tincture of Musk. Dose, 30 minims to 2 fluidrachms.

Tinctura Myrrhae or Tincture of Myrrh. A local application to indolent and foul ulcers, spongy gums, aphthous sore mouth, and ulcerations of the throat.

Tinctura Nucis Vomicae or Tincture of Nux Vomica. Dose, 10 to 20 minims.

Tinctura Opii, Tincture of Opium or Laudanum. Eleven minims or 22 drops of the tincture is the equivalent of 1 grain of opium. Dose, 5 to 10 minims.

Tinctura Opii Ammoniata or Ammoniated Tincture of Opium. Dose, 30 minims to 1 fluidrachm.

Tinctura Opii Camphorata, Camphorated Tincture of Opium, or Paregoric. A pleasant anodyne, used in cough, nausea, stomach and bowel pains, diarrhœa, and to cause sleep. Dose for an infant, 5 to 20 minims; for an adult, 1 to 4 fluidrachms.

Tinctura Opii Deodorata or Deodorized Tincture of Opium. Dose, 5 to 10 minims.

Tinctura Physostigmatis or Tincture of Physostigmata. Dose, 20 to 40 minims.

TINCTURA PYRETHRI OR TINCTURE OF PYRETHRUM. A powerful local irritant; an ingredient of mouth and tooth washes.

TINCTURA QUASSIAE OR TINCTURE OF QUASSIA. Strength doubled in the last revision. An excellent addition to tonic mixtures. Dose, ½ to 1 fluidrachm.

TINCTURA QUILLAJAE OR TINCTURE OF QUILLAJA. Dose, ½ to 1 fluidrachm.

TINCTURA RHEI OR TINCTURE OF RHUBARB. Doubled in strength of rhubarb and cardamom in the last revision. Dose, 1 to 2 fluidrachms.

TINCTURA RHEI AROMATICA OR AROMATIC TINCTURE OF RHUBARB. Dose for an adult, ½ to 1 fluidrachm.

TINCTURA SANGUINARIAE OR TINCTURE OF BLOODROOT. Emetic in dose of from 3 to 4 fluidrachms; expectorant and alterative in 15 to 60 minim doses.

TINCTURA SCILLAE OR TINCTURE OF SQUILL. Dose, as an expectorant or diuretic, 10 to 20 minims (20 to 40 drops).

TINCTURA SERPENTARIAE OR TINCTURE OF SERPENTARIA. Strength of this tincture was doubled in the last revision. Dose, 30 minims to 2 fluidrachms.

TINCTURA STRAMONII OR TINCTURE OF STRAMONIUM. Dose, 10 to 20 minims; of the British tincture, 5 to 15 minims.

TINCTURA STROPHANTHI OR TINCTURE OF STROPHANTHUS. Strength was doubled in the last revision. Dose, 5 to 10 minims; of the British, 10 to 30 minims.

TINCTURA TOLUTANA OR TINCTURE OF TOLU. Strength was doubled in the last revision. Added to expectorant mixtures in chronic bronchitis. Dose, ½ to 2 fluidrachms.

TINCTURA VALERIANAE OR TINCTURE OF VALERIAN. Dose, 1 to 4 fluidrachms.

TINCTURA VALERIANAE AMMONIATA OR AMMONIATED TINCTURE OF VALERIAN. Employed as an antispasmodic in hysteria and other nervous troubles. Dose, 30 minims to a fluidrachm.

TINCTURA VANILLAE OR TINCTURE OF VANILLA. Forms the so-called fluidextract of vanilla. Used as a flavoring agent, and to make vanilla syrup.

TINCTURA VERATRI OR TINCTURE OF VERATRUM. Dose, 10 to 30 minims.

TINCTURA ZINGIBERIS OR TINCTURE OF GINGER. A useful carminative addition to tonic and purgative infusions. Dose, 8 to 40 minims.

TRAGACANTHA OR TRAGACANTH. A gummy exudation of *Astragalus gummifer,* found in Asia Minor. Demulcent but not easily soluble; used in pharmacy as a vehicle in which to suspend heavy insoluble powders; to give consistence to troches, and to make emulsions.

TRITICUM OR COUCH GRASS. The dried rhizome of *Agropyron repens*, a troublesome weed growing everywhere. Much used in irritable bladder and cystitis. May be taken in unlimited quantities in the form of a decoction.

TRITURATION OF ELATERIN. Elaterin, 10 parts; Sugar of Milk, 90 parts. An excellent means of administering elaterin. Dose, ¼ to ⅝ of a grain. The British trituration is 2½ parts of Elaterin to 97½ parts of Sugar of Milk; and the dose is 1 to 4 grains.

Trochisci or **Troches.** Lozenges or small, dry masses of a flattened shape, composed largely of powders mixed with sugar and mucilage. Some troches have a fruit basis; others with a rose basis, a tolu basis, or a simple basis of sugar and gum acacia.

TROCHISCI ACIDI TANNICI OR TROCHES OF TANNIC ACID. Tannic Acid, 6 grammes; Sugar, 65 grammes; Tragacanth, 2 grammes; Stronger Orange Flower Water, to make 100 troches. Used in relaxation of the uvula or in chronic angina. Slowly dissolve one troche in the mouth. One grain of acid in each.

TROCHISCI AMMONII CHLORIDI OR TROCHES OF AMMONIUM CHLORIDE. Ammonium Chloride, 10 grammes; Extract of Glycyrrhiza, 20 grammes; Tragacanth, 2 grammes; Sugar, 40 grammes; Syrup of Tolu, to make 100 troches. Used in congested states of the pharynx and larynx.

TROCHISCI CUBEBAE OR TROCHES OF CUBEB. Oleoresin of Cubeb, 2 grammes; Oil of Sassafras, 1 cubic centimeter; Extract of Glycyrrhiza, 25 grammes; Acacia, 12 grammes; Syrup of Tolu, to make 100 troches. There is ¼ of a minim of cubeb in each lozenge. Used in chronic cough, or in ulceration or chronic inflammation of the fauces.

TROCHISCI GAMBIR OR TROCHES OF GAMBIR. Gambir, 6 grammes; Sugar, 65 grammes; Tragacanth, 2 grammes; Stronger Orange Flower Water, to make 100 grammes. Used in prolapsus of the uvula and relaxation of the fauces.

TROCHISCI GLYCYRRHIZAE ET OPII OR TROCHES OF GLYCYRRHIZA AND OPIUM. Extract of Glycyrrhiza, 15 grammes; Powdered Opium, ½ gramme; Acacia, 12 grammes; Sugar, 20 grammes; Oil of Anise, 2-10 cubic centimeter; Water, to make 100 grammes. Similar to Wistar's Cough Lozenges. Demulcent and anodyne; useful in allaying cough.

Trochisci Krameriae or Troches of Krameria. Extract of Krameria, 6 grammes; Sugar, 65 grammes; Tragacanth, 2 grammes; Stronger Orange Flower Water, to make 100 troches. Astringent troches to be used in chronic angina.

Trochisci Potassii Chloratis or Troches of Chlorate of Potassium. Potassium Chlorate, 15 grammes; Sugar 60 grammes; Tragacanth, 3 grammes; Water, to make 100 troches. Largely used in cases of sore throat.

Trochisci Santonini or Troches of Santonin. Santonin, 3 grammes; Sugar, 90 grammes; Tragacanth, 3 grammes; Stronger Orange Flower Water, to make 100 grammes. An excellent vermifuge and anthelmintic. Dose for a child of two years, 1 to 2 troches.

Trochisci Sodii Bicarbonatis or Troches of Sodium Bicarbonate. Sodium Bicarbonate, 18 grammes; Sugar, 54 grammes; Myristica (nutmeg), 1 gramme; Mucilage of Tragacanth, to make 100 troches. Antacid and antilithic; used in heartburn and uric acid gravel.

Ulmus or Slippery Elm. The dried bark of *Ulmus fulva,* found in the northern and western parts of the United States. An excellent demulcent; used in dysentery, diarrhœa, and diseases of the urinary passages. Used also as a poultice of the powdered bark in cases of external inflammation.

Unguenta or Ointments. Fatty substances of a butter-like consistence containing medicinal agents to be applied by inunction. The bases are usually lard, petrolatum, hydrous wool-fat, or simple ointment.

Unguentum or Simple Ointment. White Wax, 200 grammes; Benzoinated Lard, 800 grammes. A mild dressing to blistered or excoriated surfaces and is the basis of many ointments.

Unguentum Acidi Boraci or Boric Acid Ointment. Boric Acid, 100 grammes; Paraffine, 100 grammes; White Petrolatum, 800 grammes.

Unguentum Acidi Tannici or Tannic Acid Ointment. Tannic Acid, 20 grammes; Glycerine, 20 grammes; Ointment, 60 grammes. Used in piles, prolapsus ani, and in flabby ulcers.

Unguentum Aquae Rosae or Ointment of Rose Water. Spermaceti, 125 grammes; White Wax, 125 grammes; Expressed Oil of Almond, 560 grammes; Sodium Borate, 5 grammes; Stronger Rose Water, 190 cubic centimeters. Used in chapped lips and hands. A form of cold cream.

Unguentum Belladonnae or Belladonna Ointment. Extract of Belladonna Leaves, 10 grammes; Diluted Alcohol, 5 cubic centimeters; Hydrous Wool-fat, 20 grammes; Benzoinated Lard, 65 grammes.

Unguentum Chrysarobini or Chrysarobin Ointment. Chrysarobin, 6 grammes; Benzoinated Lard, 94 grammes. Used in psoriasis, ringworm, and other skin diseases.

Unguentum Diachylon or Diachylon Ointment. Lead Plaster, 50 grammes; Oil of Lavender Flowers, 1 gramme; Olive Oil, 49 grammes. Used in eczema.

Unguentum Gallae or Nutgall Ointment. Nutgall, 20 grammes; Ointment, 80 grammes. Used in piles, prolapsus ani, and flabby and indolent ulcers.

Unguentum Hydrargyri, Mercurial Ointment or Blue Ointment. Mercury, 500 grammes; Oleate of Mercury, 20 grammes; Prepared Suet, 230 grammes; Benzoinated Lard, 250 grammes. Half to 1 drachm is used at one application; used in chronic glandular swellings, erysipelas, and chilblains.

Unguentum Hydrargyri Ammoniati or Ointment of Ammoniated Mercury. Ammoniated Mercury, 10 grammes; White Petrolatum, 50 grammes; Hydrous Wool-fat, 40 grammes. Used in skin eruptions, as in psora, porrigo, and herpes.

Unguentum Hydrargyri Nitratis, Ointment of Mercuric Nitrate or Citrine Ointment. Mercury, 70 grammes; Nitric Acid, 175 grammes; Lard, 760 grammes. A stimulant and alterative application in porrigo, tinea capitis, chronic eczema, inflammation of the eye and eyelids, and other ulcerative and eruptive affections.

Unguentum Hydrargyri Oxidi Flavi or Ointment of Yellow Mercuric Oxide. Yellow Mercuric Oxide, 10 grammes; Water, 10 grammes; Hydrous Wool-fat, 40 grammes; Petrolatum, 40 grammes. Same effects as the following ointment.

Unguentum Hydrargyri Oxidi Rubri or Ointment of Red Oxide of Mercury. Red Oxide of Mercury, 10 grammes; Water, 10 grammes; Hydrous Wool-fat, 40 grammes; Petrolatum, 40 grammes. Used in indolent and foul ulcers, diseases of the scalp, and in conjunctival ophthalmia.

Unguentum Iodi or Iodine Ointment. Iodine, 4 grammes; Potassium Iodide, 4 grammes; Glycerine, 12 grammes; Benzoinated Lard, 80 grammes. Used in goitre, scrofulous swelling of the glands, and chronic swellings.

Unguentum Iodoformi or Iodoform Ointment. Iodoform, 10 grammes; Lard, 90 grammes.

UNGUENTUM PHENOLIS, OINTMENT OF PHENOL OR OINTMENT OF CARBOLIC ACID. Phenol, 3 grammes; White Petrolatum, 97 grammes.

UNGUENTUM PICIS LIQUIDAE OR TAR OINTMENT. Tar, 500 grammes; Yellow Wax, 150 grammes; Lard, 350 grammes. Used in scaly and scabby eruptions, psoriasis, lepra, and scaldhead.

UNGUENTUM POTASSII IODIDI OR OINTMENT OF POTASSIUM IODIDE. Potassium Iodide, 10 grammes; Potassium Carbonate, .6 gramme; Water, 10 grammes; Benzoinated Lard, 80 grammes. Used in goitre, scrofulous tumors, and other indolent swellings.

UNGUENTUM STRAMONII OR STRAMONIUM OINTMENT. Extract of Stramonium, 10 grammes; Diluted Alcohol, 5 cubic centimeters; Hydrous Wool-fat, 20 grammes; Benzoinated Lard, 65 grammes. An anodyne application in irritable ulcers, painful hemorrhoids, and some cutaneous eruptions.

UNGUENTUM SULPHURIS OR SULPHUR OINTMENT. Washed Sulphur, 150 grammes; Benzoinated Lard, 850 grammes. A specific for the itch, applied every night over the entire body until the complaint is cured.

UNGUENTUM VERATRINAE OR VERATRINE OINTMENT. Veratrine, 4 grammes; Expressed Oil of Almonds, 6 grammes; Benzoinated Lard, 90 grammes.

UNGUENTUM ZINCI OXIDI OR ZINC OINTMENT. Zinc Oxide, 200 grammes; Benzoinated Lard, 800 grammes. A mild astringent ointment in chronic ophthalmia, cutaneous eruptions, sore nipples, other excoriation or ulceration.

UNGUENTUM ZINCI STEARATIS OR OINTMENT OF ZINC STEARATE. Zinc Stearate, 50 grammes; White Petrolatum, 50 grammes. Similar in effect to Zinc Ointment.

UVA URSI OR BEARBERRY. The dried leaves of *Arctostaphylos uva-ursi,* found in mountainous districts. Astringent, tonic, and with direct effect upon the urinary organs. Used in gravel, chronic nephritis, ulceration of the kidneys, bladder, or urinary passages; in catarrh of the bladder, incontinence of urine, leucorrhœa, and menorrhagia. Dose of the powder, 20 grains to 1 drachm.

VALERIANA OR VALERIAN. The dried rhizome and roots of *Valeriana officinalis,* found in Europe. A gentle stimulant, especially directed towards the nervous system, but not narcotic. Used in hysteria, hypochondriasis, hemicrania, and low fevers. See Fluidextract of Valerian.

VANILLA. The cured, immature fruit of *Vanilla planifolia,* found in the West Indies, Mexico, and South America. It owes its properties to Vanillinum or Vanillin. Used for flavoring purposes.

VERATRINA OR VERATRINE. Alkaloids obtained from the seed of *Asagraea officinalis.* Locally irritant, with a peculiar effect upon the nervous system. Used in gout, rheumatism, neuralgia, epilepsy, sprains, and bruises. Dose, 1-30th of a grain.

VERATRUM. The dried rhizome and root of *Veratrum viride,* found in the United States and known as Hellebore. Used to reduce arterial excitement, and to quiet spinal spasms. Dose, 2 grains.

VIBURNUM OPULUS OR CRAMP-BARK. The dried bark of *Viburnum opulus,* cranberry tree or high bush cranberry. Very rarely employed in medicine; the berries are antiscorbutic. Dose of the bark, 30 to 60 grains.

VIBURNUM PRUNIFOLIUM OR BLACK HAW. The dried bark of *Viburnum prunifolium,* stagbush or sheepberry. Used in dysmenorrhœa, after-pains, and ovarian irritation. Dose, 30 to 60 grains.

VINUM ANTIMONII OR WINE OF ANTIMONY. Antimony and Potassium Tartrate, 4 grammes; Boiling Water, 65 cubic centimeters; Alcohol, 175 cubic centimeters; White Wine, to make 1,000 cubic centimeters. Dose as an expectorant or a diaphoretic, 10 to 30 minims; as an emetic for children, 30 minims to 1 fluidrachm.

VINUM COCAE OR WINE OF COCA. Fluidextract of Coca, 65 cubic centimeters; Alcohol, 75 cubic centimeters; Sugar, 65 grammes; Red Wine, to make 1,000 cubic centimeters. Used as a stimulating tonic in debility and in convalescence from fevers. Dose, 2 to 8 fluidrachms.

VINUM COLCHICI SEMINIS OR WINE OF COLCHICUM SEED. Fluidextract of Colchicum Seed, 100 cubic centimeters; Alcohol, 150 cubic centimeters; White Wine, 750 cubic centimeters. Dose, 30 minims to 2 fluidrachms.

VINUM ERGOTAE OR WINE OF ERGOT. Fluidextract of Ergot, 200 cubic centimeters; Alcohol, 50 cubic centimeters; White Wine, 750 cubic centimeters. Dose, 2 to 4 fluidrachms.

VINUM FERRI OR WINE OF IRON. Iron and Ammonium Citrate, 40 grammes; Tincture of Sweet Orange Peel, 60 cubic centimeters; Syrup, 100 cubic centimeters; White Wine, to make 1,000 cubic centimeters. Dose, 1 fluidrachm,

Vinum Ferri Amarum or Bitter Wine of Iron. Soluble Iron and Quinine Citrate, 50 grammes; Tincture of Sweet Orange Peel, 60 cubic centimeters; Syrup, 300 cubic centimeters; White Wine, to make 100 cubic centimeters. A mild iron tonic. Dose, 2 to 4 fluidrachms.

Vinum Ipecacuanhae or Wine of Ipecac. Fluidextract of Ipecac, 100 cubic centimeters; Alcohol, 100 cubic centimeters; White Wine, 800 cubic centimeters. Dose, as an emetic for an adult, 1 fluidounce; as an expectorant and a diaphoretic, 10 to 30 minims. As an emetic for a child one or two years old, 1 fluidrachm may be given, and repeated every 15 minutes until it operates.

Vinum Opii or Wine of Opium. Opium, 100 grammes; Saigon Cinnamon, 10 grammes; Cloves, 10 grammes; Alcohol and White Wine, of each to make 100 cubic centimeters. Dose, 5 to 10 minims.

Xanthoxylum or Prickly Ash. The dried bark of *Xanthoxylum Americanum* or of *Fagara Clava-Herculis*. Stimulant and somewhat diaphoretic. Given in chronic rheumatism and toothache. Dose, 15 to 30 grains.

Zea or Corn Silk. The fresh silk from *Zea mays* or Indian corn. A mild stimulant diuretic used in acute and chronic cystitis and bladder irritation. Dose, 1 to 3 drachms.

Zinci Acetas or Zinc Acetate. A local remedy in ophthalmia, usually in a strength of 1 to 2 grains to a fluidounce of water.

Zinci Bromidum or Zinc Bromide. Of slight medicinal value. Dose, 1 to 2 grains.

Zinci Iodidum or Zinc Iodide. Used in the form of the syrup. As an external application, it is used in the strength of from 1 to 2 grains to a fluidounce of water.

Zinci Oxidum or Zinc Oxide. Antispasmodic and astringent; used in chorea, epilepsy, whooping cough, and gastric and intestinal catarrhs. Externally it is used in several skin diseases, preferably applied as the ointment. Dose, 2 to 5 grains.

Zinci Phenolsulphonas or Zinc Phenolsulphonate. An antiseptic, astringent, stimulant to foul ulcers, and inflammations of the mucous membranes. Internally it is used as an intestinal antiseptic. Dose, 1 to 3 grains.

Zinci Stearas or Zinc Stearate. Used in eczema, acne, and other skin diseases in the form of powder or as an ointment.

Zinci Sulphas or Zinc Sulphate. Tonic, astringent, and in large doses, emetic. Used in gastric catarrh; externally as a styptic and as an application to indolent ulcers. In overdoses, an irritant poison. Dose, ¼ to ½ grain; as an emetic, 10 to 30 grains; as a wash or outward application, from 1 to 3 grains in 1 fluidounce of water.

Zinci Valeras or Zinc Valerate. Antispasmodic; and useful in diabetes insipidus, neuralgia, epilepsy, and chlorosis. Dose, 1 to 2 grains.

Zingiber or Ginger. The dried rhizome of *Zingiber officinale*, found in Hindostan, and all parts of India, in the West Indies, and at Sierra Leone in Africa. A grateful stimulant and carminative; often given in dyspepsia, flatulent colic, atonic gout; externally a rubefacient. Infusion of ginger is made by adding half an ounce of the powdered or bruised root to a pint of boiling water. Of this from 1 to 2 fluidounces may be given. Dose of the root, 10 to 20 grains.

BOOK XII.

USEFUL MEDICAL KNOWLEDGE.

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FAMILY MEDICINE CHEST.

A small, well-chosen assortment of medicines will be found a great comfort and convenience in cases of sudden illness or accident. Not only will such afford temporary relief to the sufferer, but it will be a means of relieving the anxiety of friends until the doctor comes. In cases of remoteness from either the physician or druggist, this becomes a necessity, especially in households where there are children. From this assortment the physician can draw, and so prevent the delay and inconvenience of a trip to the drug store.

A very great deal of latitude can be indulged and a great range of choice exercised in the selection. Those which appear below will be found to be very practical and convenient in all the cases which are likely to arise in a home, and will cover almost all emergencies. The following points are well worthy of attention in making up a medicine chest:—

1. Do not buy large quantities. Regard of this point will not only reduce the cost of the outfit, but will insure freshness of such as are likely to deteriorate by age and exposure to the air.

2. Keep the supply always under lock and key so that children, proverbially curious, may not have access to it. Under no circumstances should medicines be allowed to stand exposed on mantels, bureaus, pantry and closet shelves, or in drawers among other articles. This is a precaution not only against accident, but to enable one to find them quickly in cases of emergency. Many medicines deteriorate in the light, others under the effects of heat; so that a cool, dark location is desirable for the medicine closet.

3. Let each preparation be kept in a bottle—solids and powders in wide-mouthed bottles—with good fitting corks and properly and legibly labeled.

4. The labels should bear the name of the medicine and the dose very plainly marked. If the label becomes obliterated or soiled, put on a new one at once. When pouring out a dose of liquid medicine, keep the label side of the bottle turned up so that the overflow or drip will not run down on the label.

5. If a cork becomes broken or much stained with the medicine, put a new one in its place at once. Never exchange the corks of bottles.

6. When new supplies are added, do not put new drugs in bottles that have been used for other preparations. Great danger of confusion may result.

When a dose of medicine is to be given, the following points should be carefully observed to guard against serious errors:—

1. Read the label very carefully. Pour out the dose required. Then read the label again to make assurance doubly sure.

2. Never pour a dose of medicine in the dark or in imperfect light, no matter how well you may feel that you know the chest and its contents. Fatal results have followed this carelessness.

3. Always shake the bottle before pouring out a dose.

4. When drops of medicine form a dose, use the medicine dropper; and always rinse it in water before and after using.

5. Immediately replace a bottle in its proper place in the chest after using. If you wait until you have more time, you will probably forget it, and there is a risk that a child may get it before you return.

6. Keep poisonous preparations in a different sort of bottle to impress you at the time of using that they are poisonous and so to instill care in handling them, and also to enable you to find them more easily on going to the chest. Your druggist will gladly assist on this point.

7. The doses of medicines given in the Materia Medica are for adults; consult "Useful Hints and Information" on how to gauge a child's dose.

Contents of the Medicine Chest.—This list may be varied according to the needs or ability of a family. Some may be omitted; others may be added.

Aconite, tincture of.
Alcohol.
Alum.
Ammonia.
Arnica, tincture of.
Aromatic spirits of ammonia.
Asafœtida, tincture of.
Belladonna, tincture of.
Bichloride of mercury.
Bismuth, subnitrate of.
Boric acid.
Bromide of potash.
Calomel.
Camphor.
Carbolic acid.
Carron oil.
Cascara sagrada.
Castor oil.
Chloroform liniment.
Cod-liver oil.
Collodion.
Copper sulphate.
Creolin.
Digitalis, tincture of.
Dover's powder.
Epsom salts.
Flaxseed meal.
Formalin.
Ginger, essence of.
Glycerine.
Iodine, tincture of.
Iodoform.
Ipecac, syrup of.
Iron sulphate.
Laudanum.
Lead, sugar of.

Limewater.
Mustard.
Paregoric.
Peppermint, essence of.
Pepsin, essence of.
Peroxide of hydrogen.
Potassium chlorate.
Potassium permanganate.
Quinine.
Rochelle salts.
Rhubarb, powdered.
Rhubarb, syrup of.
Salicylic acid.
Seidlitz powder.
Silver nitrate.
Soda mint.
Sodium bicarbonate.
Squill, syrup of.
Sulphur.
Sweet spirits of niter.
Talcum powder.
Turpentine.
Witch hazel.
Zinc oxide.
Zinc sulphate.

To these should be added such aids as:—

Mustard plasters.
Glycerine suppositories.
Cold cream.
Vaseline.
Carbolated vaseline.
Fountain syringe.
Hot water bottle.
Oil silk.
Cloths for bandages.
Cloths for poultices.
Atomizers.
Absorbent cotton.
Medicine glasses.
Medicine dropper.

GLOSSARY OF MEDICAL AND OTHER TERMS.

NOTE.—Words which are explained in the text are not repeated here. They are to be found by consulting the Index.

Ab-do'-men. The belly, or the lower part of the body below the diaphragm.

Ab-lu'-tion. Cleansing by water; washing of the body externally.

Ab-nor'-mal. Unnatural; not according to rule; irregular.

A-bra'-sion. A superficial wound produced by rubbing off the skin.

Ab-sorb'-ent. Glands and vessels which absorb or suck up substances from within or without; also medicines which absorb, or combine with acid matter in the stomach or bowels.

Ac-couch-eur' (ak-koosh-ur'). A man who attends women in childbirth.

A-cho'-li-a. Deficiency of bile.

Ac'-id. Acrid; sour, sharp, pungent, bitter, or biting to the taste.

Ac'-tu-al Cau'-ter-y. Burning or searing with a hot iron; used in surgery.

Ac-u-punc'-ture (ak-u-punk'-ture). Pricking with needles; one of the operations of surgery.

A-cute'. Diseases of short duration, attended with violent symptoms; the reverse of chronic.

Ad-he'-sive. Tenacious, sticky; tending to adhere.

Ad'-i-pose. Matter, membrane or tissue; fat.

Ad'-ju-vant. A substance added to a prescription to aid the operation of the principal ingredient.

A-dult' Age. A person grown to full size or strength; manhood or womanhood.

Af-fec'-tion. Disorder, disease, malady.

Al-bu'-mi-nose. A substance produced in the stomach during digestion.

Al'-i-ment. Nourishment, nutrition; anything necessary for the support of life.

Al-i-ment'-a-ry Ca-nal'. The tube by which aliments are conveyed through the body; it is composed of the mouth, pharynx, œsophagus, stomach, and intestines.

Al'-ka-li (li or le). A substance which, when united to acids, neutralizes them.

Al'-ter-a-tive. A remedy which slowly changes the condition of the system.

Al-ve'-o-lar. Relating to the sockets of the teeth.

Al'-vine. Relating to the intestines.

Am-aur-o'-sis. A loss or decay of sight, produced by various causes.

A-mel'-i-o-ra'-tion. Becoming better; improvement in stages of a disease.

Am-ni-ot'-ic Liquid. The fluid surrounding the fœtus in the womb.

Am-pu-ta'-tion. The operation of cutting off a limb or other part of the body.

An-aem'-i-a. Poverty of blood; a comparatively bloodless state.

An-aes-the'-sia. Numbness or paralysis of sensation.

An-aes-thet'-ics. Agents that temporarily destroy sensation.

A-na-sar'-ca. A dropsy of the whole body; a general dropsy.

A-nas'-to-mose. To communicate with each other; applied to arteries and veins.

An'-eu-rism. A soft tumor, caused by the rupture of the coats of an artery.

An-i-mal'-cules. Animals so small as to be visible only with a microscope.

Ant'-ac-id. A substance which neutralizes acids; alkalies are antacids.

An'-thrax. A dusky red or purplish kind of tumor, occurring in the neck.
An-ti-bil'-ious (an-ti-bil'-yus). A medicine counteractive of bilious complaints.
An'-ti-dote. A protective against, or remedy for, poison or any disease.
An-ti-dys-en-ter'-ic (an-ti-dys-in-ter'-ik). A remedy for dysentery.
An-ti-e-met'-ic (an-ti-e-met'-ik). A remedy to check or allay vomiting.
An-ti-lith'-ic (an-ti-lith'-ik). A medicine to prevent or remove urinary calculi or gravel.
An-ti-mor-bif'-ic. Anything to prevent or remove disease.
An-ti-phlo-gis'-tic. Any medicine which reduces inflammation.
An-ti-scor-bu'-tic. A remedy used for the scurvy.
An-ti-sep'-tic (an-ti-sep'-tik). Whatever resists or removes putrefaction or mortification.
An-ti-si-al'-ic. Any agent that reduces the flow of saliva.
An-ti-zy-mot'-ic. A disinfectant or antiseptic used in processes of fermentation.
A'-nus. The orifice of the alimentary canal, of which it is the outlet.
A-or'-ta. The great artery from the heart.
Ap'-a-thy. Insensibility to mental or bodily pain.
A'-pex. The top or summit.
A-pha'-si-a. A lack of the power of speech, caused often by an attack of apoplexy.
A-pho'-nia. A loss of the voice.
Ap'-pe-tite. A desire for food or drink.
A-ro'-ma. Agreeable odor of plants and other substances.
Ar-o-mat'-ic. A fragrant, spicy medicine.
Ar'-te-ry. A vessel that conveys the blood from the heart to the organs.
Ar-thro'-di-a. A joint movable in every direction.
Ar-tic'-u-lat-ed. Having joints.
Ar-tic-u-la'-tion. The union of bones with each other, as at the joints.
As-car'-i-des. Pinworms or threadworms found in the lower portion of the bowels.
As-ci'-tes. Dropsy of the abdomen.
As-phyx'-ia. Suspended animation; apparent death, as from drowning.
As-then'-ic. Debilitated.
At'-o-ny. Debility; want of tone; defect of muscular power.
At'-ro-phy. A wasting of flesh and loss of strength without any sensible cause.
At-ten'-u-ants. Medicines for reducing the body.
Au'-ri-cle. A cavity of the heart.
Ax-il'-la. The armpit; hence axillary, pertaining to the armpit.
Ax'-il-la-ry Glands. Situated in the armpit, secreting a fluid of peculiar odor.
Bal-sam'-ics. Medicines employed for healing purposes.
Bi-en'-ni-al. Continuing alive for two years.
Bile or *Gall.* A fluid secreted by the liver, which promotes digestion.
Blis'-ter. A thin watery bladder on the skin.
Bou-gie' (boo-zhe'). A taper body introduced into a passage or sinus to keep it open or enlarge it.
Bron'-chi-al. Pertaining to the branches of the windpipe in the lungs.
Bul'-bous. Round or roundish.
Ca-chex'-y (ka-keks'-y). A bad state of the body. It may be caused by blood poisons.
Cal'-lous. Hard or firm.
Ca-lor'-ic. Heat.
Cap'-il-la-ry. Fine, hair-like.
Ca'-ri-es. Ulceration of a bone.
Ca-rot'-id Artery. The great arteries of the neck that convey blood to the heart.
Car'-ti-lage. A hard elastic substance of the body; gristle.
Cat-a-me'-ni-a. The menses, or monthly discharges of women.
Cath'-e-ter. A curved instrument introduced into the bladder through the urethra for drawing off the urine.
Caus'-tic. Burning; a substance which burns or corrodes living tissues.
Cau'-ter-y. A burning or searing any part of the animal body.
Cer'-e-bral. Relating to the brain.
Cer'-e-bral-De-press'-ant. Lowers and decreases excitement of cerebrum.
Cer'-e-bral-Ex-cit'-ant. Stimulates and increases activity of cerebrum.
Cer'-e-bro-Spi'-nal. Pertaining to the brain and spinal cord.
Ce-ru'-men. The ear wax.
Cha-lyb'-e-ate (ka-lib'-e-ate). Containing iron in solution, as occurring in mineral springs.
Chol'-a-gogues. Medicines that increase the flow of bile, as calomel and podophyllin.
Chol'-er-ic (kol'-er-ic). Easily irritated; irritable.
Chron'-ic. Continuing for a long time, and becoming a fixed condition of the body.
Ci-ca'-trix. A scar that remains after a wound.
Cir-cu-la'-tion. The motion of the blood, which is propelled by the heart through the body.
Cli-mac'-ter-ic. A term generally applied to the time at which the menses finally cease.
Clys'-ter. An injection; a liquid substance thrown into the lower intestine.
Co-ag'-u-la'-tion. A change from a fluid to a solid condition, as in the coagulation of the blood.
Co-ag'-u-lum. A clot of blood.
Co-a-lesce' (ko-a-les'). To grow together; to unite.
Col-lapse'. Sudden failure or prostration of the vital functions.
Col-liq'-ua-tive (kol-lik'-wa-tiv). Excessive

discharges from the body which weaken the system.

Co'-lon. A portion of the large intestine.

Co'-ma, Co'-ma-tose. Lethargy; disposed to sleep; stupor.

Com'-press. Several folds of linen rags; a bandage.

Con-cus'-sion (kon-kush'un). A violent shock, as of the brain.

Con'-flu-ent. Running together.

Con-gen'-i-tal. From birth, or born with.

Con-ges'-tion (kon-jest'-yun). Distention of any part by an accumulation of blood.

Con-junc-ti'-va. The membrane which lines the eyelid and covers the eye.

Con-sti-pa'-tion. Costiveness; obstruction or hardness of the contents of the intestines.

Con-ta'-gious. Catching, or that may be communicated by contact.

Con-tu'-sion. A bruise.

Con-va-les'-cence. Gradual return to health after sickness.

Con-vul'-sions. Involuntary and violent movements of the body.

Cor'-dial. A medicine that mildly stimulates and raises the spirits.

Cor'-ne-a. The transparent membrane in the forepart of the eye.

Cor-ro'-sive. Substances that consume or eat away.

Coun'-ter-ir-ri-ta'-tion. Drawing disease from one part by irritating another part.

Cri'-sis. The turning point of a disease.

Cu-ta'-ne-ous. Pertaining to the skin, as cutaneous diseases.

Cu'-ti-cle (ku'-ti-kl). The outer or scarf skin.

Cyst. A bag or sac containing matter or other fluid.

De-bil'-i-ty. Weakness.

De-coc'-tions (de-kok'-shuns). Medicines prepared by boiling.

Deg-lu-ti'-tion. The act of swallowing.

Del-e-te'-ri-ous. That which is hurtful.

De-lir'-i-ants. A narcotic wnich produces delirium.

De-lir'-i-um. Wildness or wandering of the mind.

Den'-ti-frice. Medicated pastes or powders for cleansing the teeth and gums.

Den-ti'-tion. Teething.

De-ob'-stru-ent. A mild laxative; an aperient.

De-ple'-tion. Diminution of the quantity of blood by blood-letting or other process.

Dep'-u-ra-tion. Cleansing from impure matter.

Derm. The natural tegument or covering of an animal.

De-ter'-gent. A medicine that cleanses from offending matter.

Di-ag-no'-sis. The act of distinguishing diseases by symptoms.

Di'-a-phragm (di'-a-fram). The muscular division between the chest and the abdomen.

Di-ath'-e-sis. Tendency of the body to any form of disease, as scrofulous diathesis.

Di-e-tet'-ic. Relating to diet or regimen.

Dil-a-ta'-tion. Act of expanding or spreading in all directions.

Dil'-u-ents. That which thins, weakens, or reduces the strength of liquids.

Dis-cu'-tients. Medicines which scatter a swelling or tumor, or any coagulated fluid or body.

Dis-lo-ca'-tion. The displacement of a bone out of its socket.

Dis-po-si'-tion. Tendency.

Dor'-sal. Pertaining to the back.

Dras'-tics. Active or strong purgatives.

Du-o-de'-num. The first of the small intestines.

Dys'-cra-sia. A bad habit of body producing generally a diseased condition of the system.

Dys-pha'-gi-a. Difficulty of swallowing.

Dysp-noe'-a. Difficulty of breathing.

Dys-u'-ri-a. Difficulty in discharging urine, attended with pain and heat.

Eb-ul-li'-tion. The motion of a liquid by which it gives off bubbles of vapor as in boiling.

Ef-fer-ves'-cence. The escape of gas from a fluid, as in the so-called "soda-water."

Ef-flo-res'-cence. Eruption or redness of the skin, as in measles, scarlet fever, etc.

Ef-flu'-vi-a. Exhalations from substances, as from flowers or decaying matter.

Ef-fu'-sion. An escape of the fluids of the body from their natural position into the tissues or cavities of the body.

E-lec-tri-za'-tion. Medical use of the electric currents.

E-lec'-tu-ary. Medicines mixed with honey or syrup.

E-lim-i-na'-tion. Discharged from the body, as by the pores of the skin.

E-ma-ci-a'-tion. Wasting away of the flesh.

Em'-bry-o. The early stage of the fœtus.

Em'-e-sis. Vomiting.

E-met'-ics. Medicines given to cause vomiting.

E-mol'-li-ent. A softening application which allays irritation.

E-mul'-sion. A mixture; as oil and water mixed with mucilage or sugar.

En-ceph'-a-lon. The whole of the brain.

En-cyst'-ed. Inclosed in a cyst or sac.

En-dem'-ic. A disease peculiar to a certain district.

En-er-va'-tion. A loss of nervous tone and reduction of strength.

En-te-ri'-tis. Inflammation of the bowels.

En-to-zo'-a. Intestinal worms living in some part of an animal body.

E-phem'-e-ral. Of short duration.

Ep-i-dem'-ic. A disease that prevails.

Ep-i-derm'-is. The scarf skin; the cuticle.
Ep-i-gas'-tric. Pertaining to the upper and anterior part of the abdomen.
Ep-i-glot'-tis. A leaf-shaped cartilage, whose use is to prevent food or drink from entering the larynx and obstructing the breath while eating.
E-piph'-o-ra. An overabundant secretion of tears, causing what is termed a watery eye.
Ep-i-spas'-tic. An application for blistering.
Ep-is-tax'-is. Bleeding from the nose.
Ep-i-the'-li-um. A layer of cells covering membranes.
Er'-e-thism. Morbid, energetic action of irritability.
E-ro'-sion. Eating away; corrosion.
Er'-rhine (er'-rin). A medicine for snuffing up the nose to promote the discharge of mucous.
E-ruc-ta'-tion. Belching; gulping of wind from the stomach.
E-rup'-tion. A breaking out on the skin.
Es'-char (es'-kar). The dead part, killed by caustic or mortification, which falls off.
Es-cha-rot'-ic. Caustic; an application which sears or destroys the flesh.
Eu-sta'-chi-an tube (yu-sta'-ki-an). A narrow canal connecting the middle ear and throat.
E-vac-u-a'-tion. Movement of the bowels, or passing of urine from the bladder.
Ex-ac-er-ba'-tion (egz-as-er-ba'-shun). Increase of severity in a disease.
Ex-an-the'-ma. An eruptive disease, with fever, as smallpox, measles.
Ex-ci'-sion. Cutting out of a part.
Ex-cit'-ant. A stimulant.
Ex-co'-ri-ate. To abrade or scrape off the skin in any way.
Ex-cres'-cence. An abnormal or unnatural growth of a part, as a wart or tumor.
Ex-cre'-tion. Waste matter thrown off from the system, as the perspiration, fæces, etc.
Ex-fo'-li-ate. Scaling or peeling off; separation of decayed from living bone.
Ex-ha-la'-tion. Emission of vapor, air, gas, etc.
Ex-os-to'-sis. An unnatural growth from a bone; a bony tumor.
Ex-pec'-to-rant. A medicine which aids the discharge of phlegm from the bronchial tubes or lungs.
Ex-pec-to-ra'-tion. Discharge of phlegm, mucus, or saliva from the mouth.
Ex-pi-ra'-tion. The act of breathing out the air from the lungs.
Ex-trav-a-sa'-tion. Effusion; emptying or forcing a fluid out of its proper vessels.
Ex-u-da'-tion. Perspiration; the discharge of moisture on the surface of bodies.
Fae'-cal (fe'-kal). Pertaining to fæces.
Fae'-ces (fe'-cez). The natural discharges of the bowels.
Far-a-di-za'-tion. The use of the Faradaic current.
Far-i-na'-ceous. Containing starch, as farinaceous food, starchy food.
Fau'-ces. The back part of the mouth, at the entrance of the throat.
Feb'-ri-fuge. A medicine which assuages fever and produces perspiration.
Fe'-brile. Having the symptoms of fever; feverish.
Fem'-o-ral. Pertaining to the femur.
Fe'-mur. The thigh bone.
Fet'-id. Having a rank, disagreeable odor.
Fi'-brine. Animal matter found in blood.
Fi'-brous. Composed of small threads or fibers.
Fil'-ter. A strainer.
Fil-tra'-tion. Straining.
Fis'-tu-la. A deep, narrow, crooked ulcer.
Flac'-cid (flak'-sid). Soft and weak, lax, limber; as a flaccid muscle.
Flat'-u-len-cy, Fla'-tus. Wind in the stomach and intestines causing uneasiness.
Flex'-i-ble. Easily bent; yielding to pressure.
Flood'-ing. Profuse flow of blood.
Flush. A sudden flow of blood to the face.
Flux. An unusual discharge from the bowels.
Foe'-tus (fe-tus). The child in the womb.
Fo-men-ta'-tion. Bathing by means of flannels dipped in hot water or medicated liquid.
For-mi-ca'-tion. A sensation like the creeping of ants.
For'-mu-la. A prescription.
Fric'-tion. The act of rubbing.
Fu-mi-ga'-tion. A vapor raised by burning.
Func'-tion. The work or office performed by any part or organ of the body.
Fun'-da-ment. The seat; the lower extremity of the large intestine.
Fun'-gus. A spongy excrescence, as proud flesh.
Gal-va-ni-za'-tion. Use of the galvanic current.
Gan'-gli-on (gang'-gli-on). An enlargement in the course of a nerve.
Gan'-grene. Mortification or death of a part.
Gar'-gle. A wash for the mouth and throat.
Gas'-tric. Belonging to the stomach.
Gas-tri'-tis. Fever or inflammation of the stomach.
Ges-ta'-tion. The period of pregnancy.
Gland. A soft body, the function of which is to secrete some fluid.
Glot'-tis. The opening into the windpipe, covered by the epiglottis.
Glu'-te-us. A name given to the muscles of the hip.
Gran-u-la'-tion. The healing of a wound or ulcer by the formation of grain-like fleshy masses.

Gru'-mous. Thick; clotted; concreted; as grumous blood.
Gut'-tur-al. Pertaining to the throat.
Hab'-it. A peculiar state or temperament of the body.
Hec'-tic. A remitting fever, with chills, heat and sweat.
Hem-a-to'-sis. An excessive or morbid quantity of blood.
Hem-i-ple'-gia. Paralysis of one side of the body.
He-mop'-ty-sis. A spitting of blood.
Hem'-or-rhage. Bleeding; a flow of blood, as from the lungs, nose, etc.
Hem'-or-rhoids. The piles; tubercles from which blood or mucus is discharged.
He-pat'-ic. Pertaining to the liver.
He-pat'-ic-De-press'-ants. Agents which lower the activity of the liver.
Her-ba'-ceous (her-ba'-shus). Pertaining to herbs.
He-red'-i-ta-ry. Descended from a parent; inherited.
Her'-ni-a. A rupture, and protrusion of some part of the abdomen.
Her'-pes. An eruption on the skin, as tetter, ringworm, etc.
Hu'-mors (yu'-mors). The fluids of the body.
Hy-per-es-the'-si-a. Excessive and abnormal sensibility.
Hyp-o-chon-dri'-a-cal. Melancholy; very dejected; low-spirited.
Hy-po-der'-mic. Under the skin.
Hys-ter'-ic-al. Nervous; subject to hysteria.
I'-chor (i'-kor). A thin, watery, and acrid discharge from an ulcer.
Id'-i-op'-a-thy. A morbid condition not preceded by any other disease.
Id-i-o-syn'-cra-sies. Peculiarities of constitution or temperament.
Il'-e-um. The lower part of the small intestines.
Il'-i-ac. Pertaining to the small intestines.
Im-be-cil'-i-ty. Feebleness; weakness of mind or intellect.
In-a-ni'-tion (in-a-nish'-un). Emptiness; weakness; exhaustion.
In-dig'-e-nous. Native to a country.
In-fec'-tion. Contagion.
In-fu'-sion (in-fu'-zhun). Medicine prepared by boiling or steeping.
In-ges'-tion (in-jest'-yun). Throwing into the stomach.
In-jec'-tion (in-jek'-shun). Liquid sent into some part of the body by means of a syringe.
In-oc-u-la'-tion. Communicating a disease to a person in health by inserting contagious matter in the skin.
In-spi-ra'-tion. Drawing or inhaling air into the lungs.
In-spis-sa'-tion. Rendering a fluid thicker by evaporation.
In-teg'-u-ment. A covering; the skin.
In-ter-cos'-tal. Between the ribs.
In-ter-mit'-tent. Ceasing at intervals.
In-tes'-ti-nal As-trin'-gents. Agents which pucker and diminish the exudation of intestinal vessels.
Ir'-ri-tants. Substances which produce inflammation when applied to a part.
Lac'-er-at-ed. Torn asunder.
Lach'-ry-mal (lak'-ri-mal). Pertaining to the tears.
Lac-ta'-tion. Act of nursing, or sucking.
Lan'-ci-na-ting. Piercing, as with sharp pointed instruments; hence lancinating pain.
Lan'-guor (lang'-gwur). Feebleness, weakness, lassitude of body.
Lar'-ynx. The upper part of the windpipe.
Lax'-a-tive. A mild purgative; a medicine that loosens the bowels.
Le'-sion. A rupture or tearing of the flesh; a wound.
Leth'-ar-gy. Unusual or excessive drowsiness.
Li-ga'-tion. The art of tying a vessel.
Lig'-a-ture. A thread for tying blood vessels to prevent hemorrhage.
Lin'-i-ment. A medicated lotion or wash; a soft ointment.
Lith'-on-trip-tic. A solvent of the stone or gravel in the bladder.
Li-thot'-o-my. The operation of cutting for stone in the bladder.
Liv'-id. Black and blue; of a lead color.
Lo'-chi-al. Pertaining to discharges from the womb after childbirth.
Lum-ba'-go. Rheumatic pains in the loins and small of the back.
Lum'-bar. Pertaining to the loins.
Lymph (limf). A whitish fluid contained by the lymphatic vessels.
Lym-phat'-ic (vessels). Fine tubes pervading the body; absorbents.
Mac-er-a'-tion. Dissolving or softening with water.
Mac'-u-lar. Colored spots; blemishes.
Mal-for-ma'-tion. A wrong formation or structure of parts.
Ma-lig'-nant. Violent; dangerous; tending to produce death.
Mat-u-ra'-tion. The formation of pus or matter in any part of the body.
Men'stru-um. A solvent; any liquid used to dissolve solid substances.
Me-phit'-ic. Suffocating; noxious; pestilential.
Me-tas'-ta-sis. A change of disease from one part of the body to another.
Mi-as'-ma, Mi-as'-ma-ta. Malaria, exhalations from swamps and decaying matter.
Mor'-bid. Diseased; corrupt.
Mor-bif'-ic. Causing disease.
Mo'-tor-De-press'-ants. Drugs which diminish or paralyze the activity of the spinal cord or motor apparatus.

Mo'-tor-Ex-cit'-ant. Any drug which increases the activity of the spinal cord or motor apparatus.

Mu'-cus. The ropy, lubricating, tenacious fluid, secreted by the mucous membrane.

Myd'-ri-at'-ic. Drugs which cause dilation of the pupil of the eye.

My-ot'-ic. Drugs which cause contraction of the pupil of the eye.

Nar-cot'-ics. Medicines that cause sleep, relieve pain, or stupefy.

Nau'-se-a (naw'-she-a). Sickness at the stomach, with a desire to vomit.

Ne-phrit'-ic. Pertaining to the kidneys.

Ner'-vine. A medicine that acts on the nerves.

Neu-ral'-gia. Pain of a nerve without apparent inflammation.

Nor'-mal. Natural; regular.

Oe-de'-ma. A watery swelling.

Ol-fac'-to-ry Nerves. The nerves of smell.

O-men'-tum. The caul or covering of the bowels.

Oph-thal'-mi-a (of-thal'-mi-a). Inflammation of the eyes.

O'-pi-ates. Medicines which promote sleep.

Op'-tic Nerve. The nerve which enters the back part of the eye.

Or-thop-noe'-a. Great difficulty of breathing, caused by diseases of the heart or diaphragm, or asthma.

Os'-si-fy. To change flesh or other soft matter into a hard, bony substance.

O'-vum. An egg.

Pal-pi-ta'-tion. Unnatural action of the heart, in which it beats too rapidly and strongly.

Pan-a-ce'-a. A cure-all; a universal medicine.

Pa-pil'-la. A red, elevated point upon the tongue or elsewhere.

Par-a-cen-te'-sis. Puncturing of the chest or abdomen for the purpose of drawing off water.

Par-a-ple'-gi-a. Paralysis of the lower half of the body.

Par'-ox-ysm. A fit of disease taking place periodically.

Par-tu-ri'-tion. Childbirth.

Pec'-tor-al. Pertaining to the chest.

Pel'-vis. A bony cavity forming the lower part of the trunk of the body.

Per-i-car'-di-um. The sac inclosing the heart.

Per-i-ne'-um. The space between the anus and the testicles.

Per-i-os'-te-um. A thin, hard membrane covering the bones.

Per-i-to-ne'-um. The membrane lining the abdomen and covering the bowels.

Pe-te'-chi-ae. Purple spots which appear upon the skin in low fevers.

Phag-e-den'-ic. Corroding; eating; applied to ulcers.

Pha-lan'-ges. The bones of the fingers and toes.

Phar'-ynx. The upper part of the throat.

Phlegm (flem). A stringy mucus of the respiratory and digestive passages.

Phleg-mat'-ic. Abounding in phlegm; cold; dull; sluggish; heavy.

Phlo-gis'-tic. Inflammatory.

Phthis'-ic-al (tiz'-ik-al). A condition of the system tending to pulmonary consumption.

Pleth'-or-ic. Of a full habit of body.

Pleu'-ra. A membrane that lines the inside of the chest and covers the lungs.

Pleu'-ri-sy. Inflammation of the pleura.

Pneu-mo'-ni-a (nu-mo'-ni-a). Inflammation of the substance of the lungs.

Pol'-y-pus. A pear shaped tumor.

Pre-scrip'-tion. The formula for the preparation of medicines.

Probe. An instrument for examining the depth of a wound.

Prog-no'-sis. The art of foretelling the termination of a disease.

Proph-y-lac'-tic. A medicine to prevent disease.

Pro-tect'-ives. Any agent used to cover an injured part thus excluding air, water, etc.

Pty'-a-lism (ty'-a-lism). A copious flow of saliva; salivation.

Pu-bes'-cent. Covered with down or very short hairs.

Pul'-mo-na-ry. Pertaining to or affecting the lungs.

Pun'-gent. Sharp, piercing, biting, stimulating.

Pu'-ru-lent. Consisting of pus or matter.

Pus. Yellowish white matter, found in abscesses, etc.

Pus'-tu-lant. Any agent which gives rise to pustules.

Pus'-tules. Elevations of the skin having inflamed base and containing pus.

Pu-tres'-cent. Becoming putrid; pertaining to the process of putrefaction.

Py-ro'-sis. A peculiar disease of the stomach called water-brash.

Rec'-tum. The termination of the large intestine.

Re-frig'-er-ant. Medicines which lessen the heat of a body.

Reg'-i-men. The regulation of diet in order to preserve or restore health.

Res-o-lu'-tion. Dispersion of an inflammation before pus has formed.

Re-solv'-ents. Medicines to dissipate inflammation.

Res-pi-ra'-tion. The process of breathing.

Re-stor'-a-tive. Agents which promote constructive changes.

Re-sus-ci-ta'-tion. Reviving from apparent death, as drowning.

Ret'-i-na. The semi-transparent, internal nervous tissue of the eye.

Ru-bif'-ic. Making red.

Sac'-cha-rine (rin). Sugary; having the qualities of sugar.

Sa-li'-va. The spittle; the secretions of the salivary glands of the mouth.

Sal-i-va'-tion. Increase of the secretion of saliva.

San'-guine (san-gwin). Abounding in blood, or having the color thereof.

Sa'-ni-es. A thin, often purulent discharge from wounds or ulcers.

Scab. A crust formed over a sore in healing.

Scarf'-skin. The outer skin of the body.

Scir'-rhous (skir'-rus). Hard; knotty.

Scor-bu'-tic. Pertaining to, or partaking of the nature of scurvy.

Se-cre'-tion. The separation of any substance from the blood for a special purpose.

Sed'-en-ta-ry. Accustomed to or requiring much sitting; inactive.

Sem'-i-nal. Pertaining to, or contained in, seed.

Se'-rous. Thin, watery, like whey.

Se'-rum. The watery parts of the blood, or of milk.

Si-al'-o-gogues. Medicines that promote the flow of saliva.

Sin'-a-pism. A mustard plaster.

Sin'-ew (sin'-yu). That which unites a muscle to a bone.

Slough'-ing (sluff'-ing). The separation of the dead flesh from a sore.

Sol'-vent. Having the power to dissolve solid substances.

Sor'-des. The dark matter deposited upon the lips and teeth in low fevers.

Spasm. An involuntary contraction of the muscles.

Spe-cif'-ic. An infallible remedy.

Spleen. The milt; it is situated in the abdomen and attached to the stomach.

Squa'-mous (squa'-mus). Scaly; having scales.

Ster'-tor. Noisy breathing, as in apoplexy; snoring.

Ster'-to-rous. Snoring.

Stool. A discharge from the bowels.

Stran'-gu-ry. Difficult and painful expulsion of urine.

Strict'-ure. Unnatural contraction of any passage of the body.

Stru'-ma. Scrofula.

Sub-cu-ta'-ne-ous. Under the skin.

Sup-pos'-i-to-ries. Medicinal substances introduced into the rectum to favor or restrain evacuations, or to ease pain.

Sup-pu-ra'-tion. Forming of pus.

Su'-ture. The peculiar joint uniting the bones of the skull.

Symp'-tom. A sign or token; the peculiar marks of any disease.

Syn'-o-cha. Inflammatory fever.

Ten'-don. A fibrous cord attached to the extremity of a muscle.

Te-nes'-mus. A painful bearing down sensation in the lower bowels.

Tense, Tension. Rigid, hard, stiff; drawn tightly.

Tep'-id. Warm, but not hot.

Ter'-tian (ter'-shun). Occurring every other day.

Tho'-rax. The cavity in the chest.

Tinct'-ure. Medicine dissolved in alcohol.

Tor-mi'-na. Severe griping pains.

Tor'-pid. Dull, stupid.

Tra'-che-a. The windpipe.

Tu-me-fac'-tion. The act of swelling or forming a tumor.

Tu'-mor. A distention or enlargement of any part of the body; a swelling.

Ul'-cer. A sore, discharging pus.

Um-bil'-ic. The navel, or pertaining to the navel.

U'-rea. A substance found in the urine.

U-re'-ter. The duct or tube through which the urine passes from the kidneys to the bladder.

U-re'-thra. The canal through which the urine passes from the body.

U'-vu-la. The small conical body projecting from the middle of the soft palate.

Vac'-ci-nate (vak'-si-nate). To inoculate with the cowpox by inserting the vaccine in the skin.

Vac'-cine (vak'-sin). Belonging to, or matter of, the cowpox.

Va-gi'-na. The passage that connects the vulva with the womb.

Val-e-tu-di-na'-ri-an. A person of a weak, infirm, or sickly constitution.

Ve'-hi-cle (ve'-hi-kl). A liquor in which to administer medicines.

Ve'-nous. Relating to the veins.

Ves'-i-ca-ting. Blistering.

Ves'-i-cle (ves'-i-kl). A little bladder of water formed under the skin.

Vir'-u-lent. Extremely injurious; malignant; poisonous.

Vi'-rus. Active, contagious matter.

Vis'-ce-ra. The internal organs of the body.

Vis'-cid. Glutinous; sticky; tenacious.

Vit'-re-ous Hu'-mor. One of the fluids of the eye, resembling glass.

Vol'-a-tile. Easily evaporated; substances that waste away on exposure to the atmosphere.

Vul'-ner-a-ry. Pertaining to wounds.

Zy-mot'-ic. Contagious; infectious; such diseases as may be inoculated.

USEFUL HINTS AND INFORMATION.

DOSES FOR CHILDREN.

Brundage's Rule for a Child Less Than One Year Old.—Take the number of months that the child lacks of being one year old; add 12; make that the denominator of a fraction whose numerator is 1. That will be the fraction of the adult dose to be given. Thus: a child of 6 months old lacks 6 months of being a year old; take 6, add 12; place the result, 18, in the fractional form of 1-18; and give the child 1-18 of the adult dose.

General Methods for Children One Year or Over.—Take the age at the next birthday, and divide this by 24. Give the fractional part of the adult dose. Thus: for a child over 5, give 6-24 of ¼ of the regular dose; for 11 years, give 12-24 or ½. In giving aconite to young children to break up a fever, or to abort threatened attack, where minute doses are to be given, it is well to take about 10 drops in a half tumblerful of water and give a teaspoonful every 20 minutes until perspiration is induced. Stop as soon as this occurs. This is a most satisfactory method of giving minute doses of strong medicines to young children.

Dr. Young's Rule.—Divide the age of the child by the age plus 12. This gives the required fraction of the adult dose. Thus: for a child of 6, divide 6 by $6 + 12 = \frac{6}{18}$ or $\frac{1}{3}$ of the adult dose.

URINE.

Acid urine will turn blue litmus paper red. Alkaline urine will turn litmus paper blue.

The normal specific gravity of urine, as shown by the urinometer, is from 1018 to 1022; a high specific gravity indicates the presence of much solid matter. The average quantity passed in 24 hours is about 40 ounces or 2½ pints.

The solids contained in healthy urine are: urea, uric acid, hippuric acid, creatinin, sodium chloride, phosphates and sulphates of sodium, potassium, magnesium, and calcium. The solids in diseased conditions are: albumen, sugar, pus, blood, acetone, diacetic acid, fat, chyle, casts, cells, epithelia, and bacteria.

THERMOMETER.

The standards most generally used are the Fahrenheit and the Centigrade. The Reaumur is used principally in Russia. In the Fahrenheit scale, the boiling point of water is marked 212 degrees; the freezing point is marked 32 degrees. The space between these two is then marked off into 180 equal spaces, each of which is a degree Fahrenheit. Thirty-two of these spaces below the freezing point marks the zero of this scale, or 0 degrees. The temperature of the body on this scale is 92.4 degrees.

The Centigrade thermometer is an accompaniment of the metric system so generally in use in European countries and by scientists the world over. The boiling point of water is marked 100 degrees Centigrade, and the freezing point, 0 degrees Centigrade. The space between these points is then divided into 100 equal spaces, each of which is a degree Centigrade.

Thus it will be seen that 100 degrees Centigrade are equal to 180 degrees Fahrenheit; and a degree Fahrenheit is 100-180 or 5-9 of a degree Centigrade; a degree Centigrade is 9-5 or 1 4-5 degrees Fahrenheit. In converting degrees Fahrenheit into degrees Centigrade it must be remembered that the zero Fahrenheit is 32 degrees below the freezing point.

To convert degrees Centigrade into degrees Fahrenheit: Multiply the degrees Centigrade by 9; divide by 5; and add 32 degrees. Thus: 40 degrees Centigrade $= \frac{9\times40}{5} \times 32 = \frac{360}{5} \times 32 = 72 \times 32 =$ 104 degrees Fahrenheit.

To convert degrees Fahrenheit into degrees Centigrade: Subtract 32 from the given number of degrees Fahrenheit; multiply by 5; and divide by 9. Thus: 40 degrees Fahrenheit $= \frac{5(40-32)}{4} = \frac{5\times8}{9} = \frac{40}{9} = 4\frac{4}{9}$ degrees Centigrade.

FACTS ABOUT MEDICINES.

The action of medicine is modified by the condition of the individual, by the climate and season.

In summer certain medicines act more vigorously than in winter, and the same person may not bear the same dose in July that he could in December. Persons of a phlegmatic temperament bear stimulants and purgatives better than those of a sanguine temperament, therefore the latter require smaller doses. Purgatives never act so well upon persons accustomed to take them as upon

those who are not, and in cases where purgatives are necessary to be often used the form and kind should be changed occasionally.

Purgatives should never be given when the bowels are in a state of irritation. Stimulants and narcotics never act as quickly upon persons accustomed to the use of stimulants.

Medicine for females should not be so strong as for males. Reduce about one-eighth.

Persons whose general health is good bear stronger doses than the debilitated and those who have suffered for a long time.

Castor oil may be taken in milk, coffee, or spirit, such as brandy; but the best method of covering the nauseous flavor is to put a tablespoonful of strained orange juice in a wineglass, pour the castor oil into the center of the juice, and then squeeze a few drops of lemon juice upon the top of the oil.

Cod-liver oil may be taken, like castor oil, in orange juice.

Peppermint water almost prevents the nauseous taste of Epsom salts.

A strong solution of extract of licorice covers the disagreeable taste of aloes; milk that of cinchona bark; and cloves that of senna.

An excellent way to prevent the taste of medicines is to have the medicine in a glass, as usual, and a tumbler of water by the side of it. Then take the medicine and retain it in the mouth, which should be kept closed, and if you then commence drinking the water, the taste of the medicine is washed away.

It is desirable to render medicines as palatable and pleasant as possible and to administer them at such times, and with such precautions, as shall render their retention and action most probable; for adults, who can swallow pills, this is the easiest and best mode of taking such remedies as will go in a small compass. For children generally they are unsuitable, and draughts or powders must be given to them, unless, as is now often the case, medicated cakes or lozenges, containing the remedies which their cases require, can be procured.

The best vehicle for children's powders which contain any heavy substance is sugar moistened just a little, or honey, or molasses, or gum; it must be some thick substance or the powder will fall to the bottom, and so not be taken. Powders with rhubarb, magnesia, or any light substance may be mixed up thin and drunk; a piece of sugar with a few drops of essence of peppermint on it, or a strong peppermint lozenge, will get rid of the unpleasant taste perhaps sooner than anything else; those who object to this should chew a piece of dried orange peel both before and after swallowing the medicine. Aperients are best taken on an empty stomach, so are vermifuges; tonics should be taken an hour or so before meals, except preparations of iron, which are best an hour after meals; emetics are commonly directed to be taken in the evening, because after their operation the patient may rest awhile. Stimulants of course may be taken at any time when required; opiates always at bedtime, that their action may not be interrupted; unless it be a case of spasm or violent pain which calls for instant relief. Strong purgatives are best taken in the morning; at night they would disturb the rest, and cause great inconvenience. All these, of course, are but general rules, to which there are numerous exceptions. The discreet mother or nurse will know when they are to be strictly followed, and when departed from.

Condition of the Stomach.—The least active remedies operate violently on some persons, owing to a peculiarity of stomach or disposition of body unconnected with temperament. In giving medicines, the medical man always so regulates the intervals between doses that the following dose may be taken before the effect produced by the former is altogether effaced. By not attending to this rule, the cure is always commencing, but never rapidly proceeding—it may, indeed, have no effect at all. It is to be borne in mind, at the same time, that some medicines, such as mercury, etc., are apt to accumulate in the system, and danger may thence arise if the doses be repeated too frequently. Aloes and castor oil acquire greater activity by use, so that the dose requires to be diminished. With due caution, and a proper attention to the doses ordered, no untoward circumstance need arise.

The condition of the mind has a powerful influence upon the disorders of the body. The effect of the imagination works wonders for or against recovery. Many of the extraordinary cures credited to traveling "medicine men," "great remedies," etc., are nothing more than the influence of the imagination over a disordered body or mind.

APPROXIMATE MEASURES.

For the convenience of those who have not accurate measures at hand, we give the approximate quantities:—

A teacup contains four fluid ounces, or one gill.

A wineglass contains two fluid ounces.

A tablespoon contains one-half fluid ounce.

A teaspoon contains one-eighth fluid ounce, or one dram.

Sixteen large tablespoonfuls make half a pint.

Eight large tablespoonfuls make one gill.

Four large tablespoonfuls make half gill.

Sixty to eighty drops are equal to one teaspoonful.

APOTHECARIES' WEIGHT.

20 grains	= 1 scruple	= 20 grains.
60 grains	= 1 dram	= 3 scruples.
480 grains	= 1 ounce	= 8 drams.
5,760 grains	= 1 pound	= 12 ounces.

The scruple and dram are discarded in the new weights. Measures of capacity are used for liquids in mixing medicines. Formerly wine measure was employed, but now it is the imperial. The weight of the imperial minim of water is 91 grains, and is multiplied as follows:—

60 minims	= 1 fluid dram	= 60 minims.
480 minims	= 1 fluid ounce	= 8 fl. drams.
9,600 minims	= 1 pint	= 20 fl. ozs.
76,800 minims	= 1 gallon	= 8 pints.

The fluid ounce is the measure of one ounce of water; the pint, 1¼ lbs.; and the gallon, 10 lbs. In prescriptions the weights and measures are generally expressed by signs or symbols, with Latin numerals affixed. These signs, with the Latin and English words which stand for them, are given below:—

m	Minim, 1-60th part of a fluid drams.
℈ j	Scrupulus, a scruple.
ʒ j	Drachma, a dram.
f ʒ j	Fluid Drachma, a measured dram.
℥ j	Uncia, an ounce (437.5 grains).
f ℥ j	Fluid uncia, a measured ounce.
℔ j	Libra, a pound (7,000 grains).
O j	Octarius, a pint.
gr	Granum, a grain.
ss	Semis, half, affixed to any of the above signs.

The numerals j, ij, iij. iv, v, etc., show the number of grains, ounces, pounds, etc., to be taken; thus, *m*lx denotes 60 minims, ʒ vii, 7 drams, and ℥ j, 1 ounce.

Teaspoonful.—Generally taken to mean 1 fluid dram or ⅛ of an ounce; but, in reality, it is 1-6 of an ounce or 1 1-3 drams.

Dessert-spoonful.—About 2 fluid drams or ¼ of an ounce.

Tablespoonful.—About 4 fluid drams or ½ an ounce.

Wineglass.—About 2 fluid ounces or ⅛ of a pint.

Pint.—16 fluid ounces, or 128 fluid drams, or 7680 minims. It is ⅛ of a gallon; 28 7-8 cubic inches; and .4732 of a litre (less than ½).

Minim.—1-60 of a fluid dram. It is generally taken to mean a drop. But this is not always true and in practice ought not to be followed. So much depends upon the consistency of the fluid; as well as the vessel from which the medicine is dropped. If the solution is water or watery a drop poured from a bottle is from 1 to ¼ minims. A drop of wine or very dilute alcohol is from 7-20 to 1 minim; of tinctures and spirits, from 2-5 to 3-5 of a minim; of ether, 3-10 to 2-5 of a minim. If a medicine dropper is used no estimate can be made as the openings are by no means uniform in these articles. Where minims are prescribed care should be exercised in measuring them.

Dram.—⅛ of an ounce. A fluid dram is measured in a graduate. A dram (solid) is weighed.

Ounce.—A fluid ounce is 1-16 of a pint. A solid ounce is 1-12 of a pound.

Troy.—Or 1-16 of a pound avoirdupois. A Troy ounce is 31 grams. An Avoirdupois ounce is 28.35 grams.

Grain.—There are 480 grains in a Troy ounce; and 437.5 grains in an Avoirdupois ounce. There are 5760 grains in a Troy pound and 700 grains in an Avoirdupois pound. A grain is 1-15 of a gram (the basis of the metric system of weight).

Pound.—A pound of a liquid, as used by the druggist, is a pint. A pound Troy contains 12 ounces, or 96 drams, or 5760 grains. A pound Avoirdupois contains 16 ounces, or 7000 grains.

PROPER DOSES FOR DIFFERENT AGES.

Ages.	Proportional Doses.	Dose.
For an Adult	Suppose the dose ONE	as 1 dram or 60 grains.
Under 1 year	Will require only 1-12th	as 5 grains.
Under 2 years	Will require only 1-8th	as 8 grains.
Under 3 years	Will require only 1-6th	as 10 grains.
Under 4 years	Will require only 1-4th	as 15 grains.
Under 7 years	Will require only 1-3d	as 1 scruple or 20 grains.
Under 14 years	Will require only 1-2	as 1-2 dram or 30 grains.
Under 20 years	Will require only 2-3ds	as 2 scruples or 40 grain.
Above 21 years	The full dose ONE	as 1 dram.
Above 65 years	Will require only 3-4ths	as 45 grains.
Above 80 years	Will require only 2-3ds	as 2 scruples or 40 grains.

In the same manner for fluids divide the quantity suited for an adult by the above fractional parts. If for a child under one year, the dose will be one-twelfth; under two years, one-eighth; under three years, one-sixth, and so on.

TO MAKE SOLUTIONS OF A GIVEN PER CENT FOR FOUR FLUID OUNCES.

$\frac{1}{10}$ of 1 per cent,	take $\frac{4}{5}$ grain.	4 per cent,	take 1 dram, 12½ grains.
⅛ of 1 per cent,	take 2¼ grains.	5 per cent,	take 1½ drams.
$\frac{1}{6}$ of 1 per cent,	take 3 grains.	6 per cent,	take 1 dram, 49 grains.
¼ of 1 per cent,	take 4½ grains.	7 per cent,	take 2 drams, 7 grains.
$\frac{1}{3}$ of 1 per cent,	take 6 grains.	8 per cent,	take 2 drams, 25 grains.
½ of 1 per cent,	take 9 grains.	10 per cent,	take 3 drams, 2 grains.
1 per cent,	take 18¼ grains.	12 per cent,	take 3 drams, 38 grains.
2 per cent,	take 36½ grains.	15 per cent,	take 4 drams, 33 grains.
2½ per cent,	take 45½ grains.	20 per cent,	take 6 drams, 4 grains.
3 per cent,	take 54½ grains.	25 per cent,	take 7 drams, 35 grains.

Take 4 ounces of water in each case.

PULSE BEATS PER MINUTE.

In the fœtus (before birth),	from 150 to 140.	From seven to fourteen,	from 90 to 80.
The newborn,	from 140 to 130.	From fourteen to twenty-one,	from 85 to 75.
The first year,	from 130 to 115.	From twenty-one to sixty,	from 79 to 75.
The second year,	from 115 to 100.	In old age,	from 75 to 80.
The third year,	from 105 to 95.		

RESPIRATIONS PER MINUTE.

First year,	about 35.	Puberty,	about 20.
Second year,	about 25.	Adult,	about 18.

THE CLINICAL THERMOMETER.

A clinical thermometer does not differ essentially from the common weather thermometer; it is smaller, more accurate, and is not supported in a frame. The figures are engraved on the glass, and are graduated from about 90 to 115 degrees. These thermometers are generally self-registering. At the top of the mercury there is a little piece which has purposely been left detached, to serve as an index. Before taking the temperature this is shaken down to about 96 degrees; then, as the mercury rises, the detached portion is left at the highest point reached.

The normal temperature of the body is about 98.4 degrees.

How to Take the Temperature.—There are three regions where the temperature may conveniently be taken: the bowel, the armpit, and under the tongue. In the case of children, where the knowledge of the temperature is always important, the bowel is the most convenient and generally more preferable.

The following is the method of ascertaining the temperature under the armpit: the index should be shaken down, and the instrument warmed by holding in the closed hand for a moment. The patient, if lying on the side, should be turned over, and the observation made in what was the lower armpit. The bulb of the instrument should be placed snugly within the folds of the armpit, carefully observing that it is in contact with the skin on all sides, and that none of the garments interfere. The fore-arm of the patient should be laid across the chest; while in this position, let the thermometer remain five minutes.

The temperature under the tongue is taken as follows: shake down the index and warm as before; place the bulb of the instrument as far back under the tongue as possible, close the mouth, and breathe through the nose for three minutes.

The temperature in the bowel is taken as follows: shake down the bulb and warm instrument as above directed; if the patient is an adult, he should lie on one side, with knees well drawn up; if a child, let it be placed on its chest across its mother's knee, or its legs may simply be held up enough to expose the parts; dip the instrument into sweet oil, and pass the bulb through the anus into the bowel for a space of about two inches, and let it remain three minutes.

The instrument should be thoroughly cleansed with carbolic acid after each observation and in cases of contagious diseases.

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